



# ENGINEERING GUIDELINES

## NEIGHBOURHOOD DESIGN MANUAL

Version 1.0  
September 2023



**City of  
Whittlesea**

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*Olivine Boulevard,  
Donnybrook*



# 1. Introduction

Engineering and construction approvals are an integral part of planning and developing new neighbourhoods.

This process involves a range of disciplines and multitude of stakeholders, each with their own unique and at times conflicting goals and requirements. To support a successful implementation and quality outcomes, a collaborative approach where all stakeholders understand and balance competing interests is essential.

This document provides an integrated planning and engineering framework for the preparation of subdivision layouts and development of infrastructure. This includes:

- The City of Whittlesea's objectives and requirements for subdivision and land development, along with required processes and standards.
- Documentation of integrated planning and design approach.
- Guidance on design and delivery of sustainable communities.
- Cross references and supplementary information to other relevant publications.

## About the Guidelines

The Neighbourhood Design Manual's Engineering Guidelines (the Guidelines) outline engineering requirements to plan for and deliver attractive, safe, inclusive, functional and sustainable developments in the City of Whittlesea.

## Relevant policies and standards

The Guidelines have been prepared to support policies and strategies from the Victorian Government and the City of Whittlesea, including but not limited to:

- Whittlesea Planning Scheme
- Approved Precinct Structure Plans (PSPs)
- *Engineering Design and Construction Manual for Subdivision in Growth Areas 2019 (EDCM)*
- City of Whittlesea's Integrated Planning Framework Strategies and Outcomes

## How to use the Guidelines

The Guidelines cross reference and complement relevant policies and standards, particularly the *EDCM*, a Council-adopted reference document for the planning, design and development of subdivision infrastructure.

## 2. Roads and Transport

The design of roads and transport for new subdivisions should follow the relevant planning framework, engineering framework, and landscaping requirements of the local and state authorities.

The design should aim to provide convenient and safe access to all allotments for vehicles, pedestrians and cyclists, as well as logical and hierarchical transport linkages with the existing arterial road layout and surrounding area.

The design should consider the sight distance, horizontal alignment, vertical alignment, cross section, intersection layout, traffic calming measures, and road safety audits of the road network.

The design should also consider the connectivity for pedestrians and cyclists through a grid-like street layout, footpaths on both sides of streets, and bicycle lanes where appropriate.

The design should also ensure that the road network is public transport capable by providing direct routes for buses along collector and arterial roads, adequate road widths and turning radii for buses, bus priority measures where needed, bus stops with shelters and seating within walking distance of all dwellings, and integration with other modes of public transport such as trains or light rail.

### 2.1 Public transport

The Department of Transport and Planning (DTP) [\*Public Transport Guidelines for Land Use and Development\*](#) should be considered when planning for land use developments. For large-scale developments it is recommended that consultation is held with the Land Use and Planning Team at the DTP prior to submitting a planning permit application.

The connector road network must be designed and constructed to be bus capable.

The DTP has limited resources; as such, it will only require that preliminary infrastructure for bus services (hardstands) be provided when the rollout of new bus routes is proposed within three (3) years of the development.

In all other instances on the connector road network, the City of Whittlesea will require the developer to provide the deviations to walking, cycling and shared user network to facilitate the spatial design requirement for the provision of a hardstand and bus stop infrastructure. They shall be at approximately 400m intervals or where the intersecting road network and adjacent land use allows or requires. Where required, the City of Whittlesea will produce a map of the indicative bus stop locations.

On the arterial and future arterial road network, the City of Whittlesea will also require the developer to provide the deviations to walking, cycling and shared user network to facilitate the spatial design requirement for the provision of a hardstand and bus stop infrastructure. They shall be at approximately 400m intervals or where the intersecting road network and adjacent land use allows or requires after liaison with the Roads Authority.

Bus infrastructure must be provided to meet the following:

- Any bus stop locations that are proposed at major intersections (such as signalised intersections and roundabouts within connector roads) will be located on the departure side of the intersection. They will allow for hardstands of 9m in length and 3m-3.2m in width (dimensions to be confirmed by DTP and PTV).
- All bus stops located along collector road routes will be provided within an indented parking lane or alternatively may also be provided as a separate indented bus bay (such as where there may not be a parking lane available, for example).
- Public lighting must be provided within 10m of bus stops.

### 2.2 Street types

The established hierarchy of road types used throughout the document is described by functional and design requirements. Full descriptions of these road types are available in the following sections. Some typical cross sections can be found in the following sections; however, the relevant planning documentation must be applied in the first instance, such as a Precinct Structure Plan (PSP) or Development Plan (DP).

## 2. ROADS AND TRANSPORT

### 2.2.1 Laneways

Laneways are ideally suited to serve up to 10 lots in a grid-based network. They should not be used to solve access issues in locations that have inadequate space.

Laneway design shall meet the following requirements:

- Not be longer than 100m. A mid-block pedestrian link shall be provided once the length between ends exceeds 60m.
- Access shall be via a heavy duty vehicular crossing from access street level 2 or lower order road.
- The minimum width is 7m. Where lighting is required or the laneway is servicing access to lots on both sides, the laneway shall be widened to 8m. Laneways shall run continuous (straight) between two access points of the road network.
- Laneways with a bend (L, T, H and U shapes) are not supported due to lack of passive surveillance and difficulties in service vehicle turning movements.
- Laneways shall be designed in accordance with Cement and Concrete Association of Australia – Guide to Residential Streets and Paths.
- Be detailed to enable easy and safe access into and out of garages (without using tilt-panel or other doors that open into the lane).
- Ensure sufficient space is available for light poles to be both protected and outside of reversing vehicle paths.

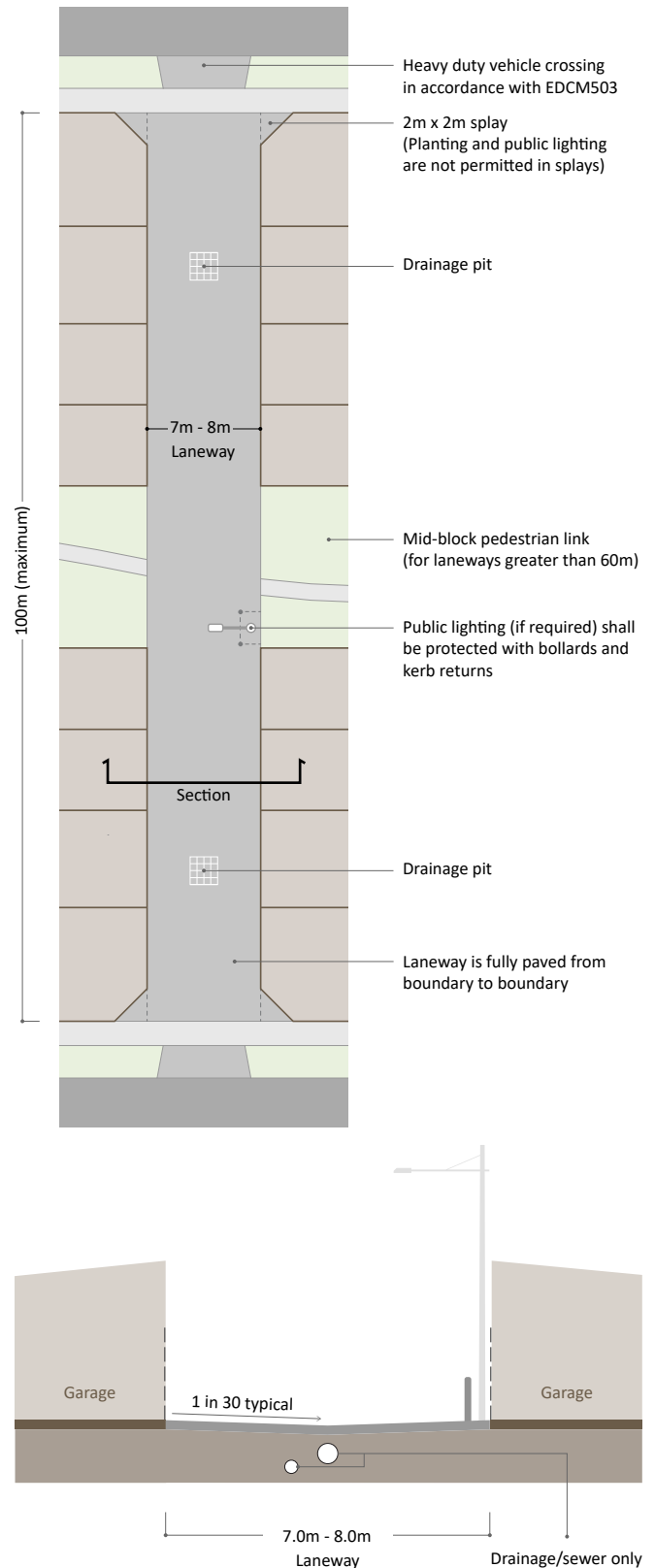


Figure 28 Preferred concrete laneway details



### 2.2.2 Service road

Service roads are generally access places located adjacent to the outer separator (or verge) of an arterial road, to provide frontage access to the adjacent properties.

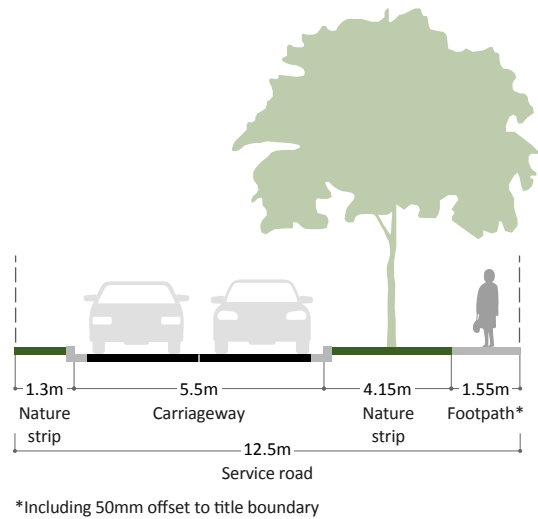
#### Design consideration

A service road shall be provided parallel to arterial road frontage. The following should be considered:

- One-way service roads must be used unless topographic conditions, street intersection spacing or other site constraints require an alternative.
- It is preferred that service roads be linked to the arterial, rather than being reliant upon loops to local access streets.
- Service roads shall be designed to ensure that vehicle entry and exit is safe given the nature of the traffic movement on the arterial road. See [Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management](#) (Austroads).

#### Notes

- A service road should be designed for one-way traffic with an entry and exit.
- The minimum road reserve must be 12.5m wide. The road reserve width shall be widened to accommodate services if required.
- The minimum nature strip width along an arterial or collector road shall be 1m; where street tree planting is required, nature strips must be a minimum of 2.5m.
- All trunk and distribution mains must be located within the arterial or collector road reserve.
- Vehicle exclusion fencing shall be provided in the outer separator.



**Figure 29** Preferred service road 12.5m wide cross section

## 2. ROADS AND TRANSPORT

### 2.2.3 Cul-de-sac

Court bowl and hammerhead terminations are only supported where topographic or vegetation considerations or other attributes limit other design outcomes, in both residential and industrial subdivisions.

Where cul-de-sacs cannot be kept very short, or avoided altogether, they shall be located in through street reservations (as wide as the approaching road reservation) with linking paths for pedestrians and cyclists. This will avoid restricted landscape opportunities, risks from overhanging trees and any safety issues associated with narrow walkways. The absolute maximum length of any cul-de-sac should be 120m.

When an approved street network includes a court bowl, the dimensions shall be such as to accommodate an unrestricted turning area and standard nature strip. Refer to WorkSafe Victoria reversing vehicle regulations and the City of Whittlesea's requirements for placement of bins as well.

For details refer to Section 10.16 Cul De Sacs and Turning Areas of the [EDCM](#).

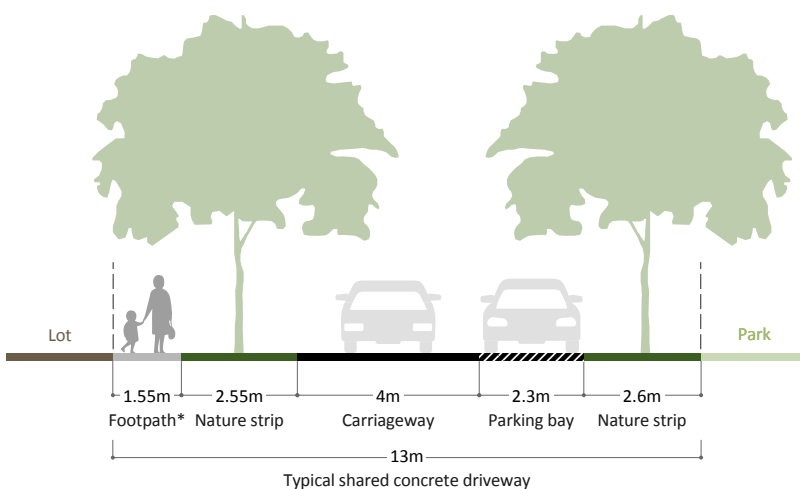
### 2.2.4 Shared driveways

Shared driveways are often used when there may be a preference to prevent or not allow for a through road. The cross section and layouts should be consistent with Figure 3 below.

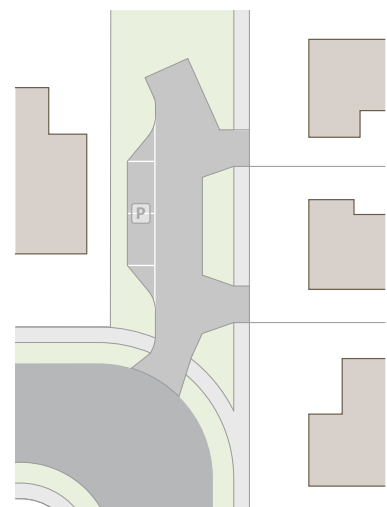
#### Notes

- The shared driveway shall only be provided for access to a maximum of four lots and shouldn't be longer than 50m in length.
- A vehicle turning area shall be provided at the end of a shared driveway for a passenger vehicle to perform a three-point turn without encroaching on nature strips, private property or indented parking spaces.
- Where two shared driveways are configured back-to-back, a small tree reserve and barriers, such as bollards, must be provided between the shared driveways.
- A shared path must not end on a private lot. A pedestrian link shall be provided to a public space or road reserve through shared driveways.

Refer to the [Landscape Guidelines for Development of Private Land](#) (City of Whittlesea) for planting opportunities.



\*Including 50mm offset to title boundary



**P** Number of car parking spaces is indicative only and needs to be confirmed with Council

**Figure 30** Preferred single frontage shared driveway cross section



**Figure 31** Preferred extended driveway layouts

## 2. ROADS AND TRANSPORT

### 2.2.5 Paper road

A 'paper road' is a narrow unformed public road reserve created on a subdivision plan. It provides access for pedestrians and emergency services vehicles. Paper roads are used to facilitate pedestrian access to residential developments that front reserves and provide activation and passive surveillance to the reserve.

#### Notes

- If a shared path is required, the paper road will be widened accordingly.
- For access to fire hydrant locations, refer to CFA guidelines.
- Paper roads should run continuously between two access points (access roads) within the road network and have a straight alignment.
- Paper roads with bends (L, T, H and U shapes) are not supported.
- Provision of a paper road must be deducted from developable land and cannot be deducted from the public open space area.
- Provision of a street address to the paper road shall be provided to meet the Australian Standard requirements for addressing.
- Provision of access for emergency services and postal services shall be provided to the front of dwellings in order to meet emergency service and postal requirements (street name sign must be provided).
- Fences fronting paper roads should either be less than 1200mm in height or at least 50% transparent.

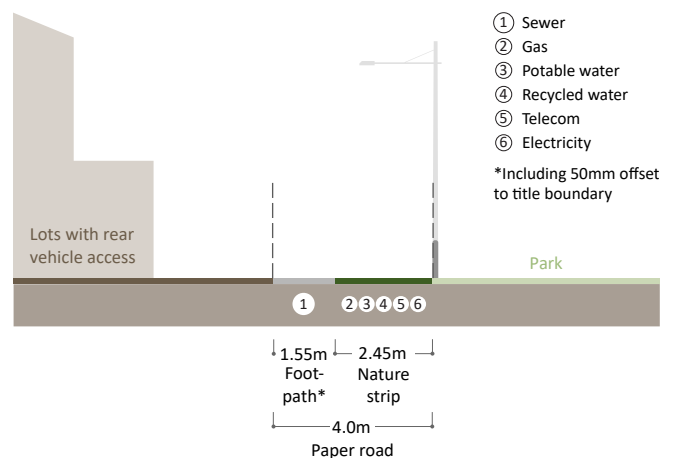
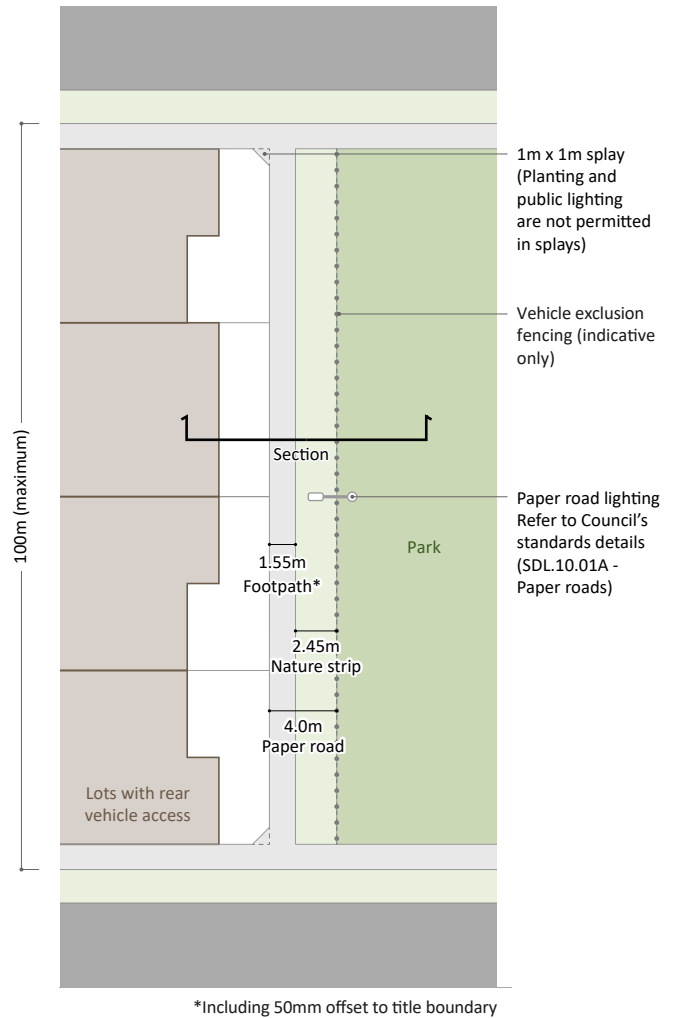


Figure 32 Preferred paper road details



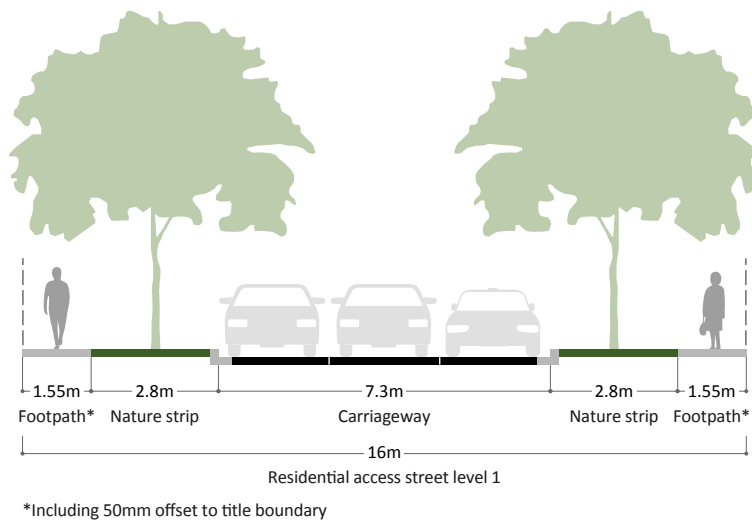
## 2. ROADS AND TRANSPORT

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### 2.2.6 Access streets

Street block lengths shall not exceed 240m to ensure a safe, permeable and low speed environment for pedestrians, cyclists and vehicles is achieved.

#### a. Residential access street level 1

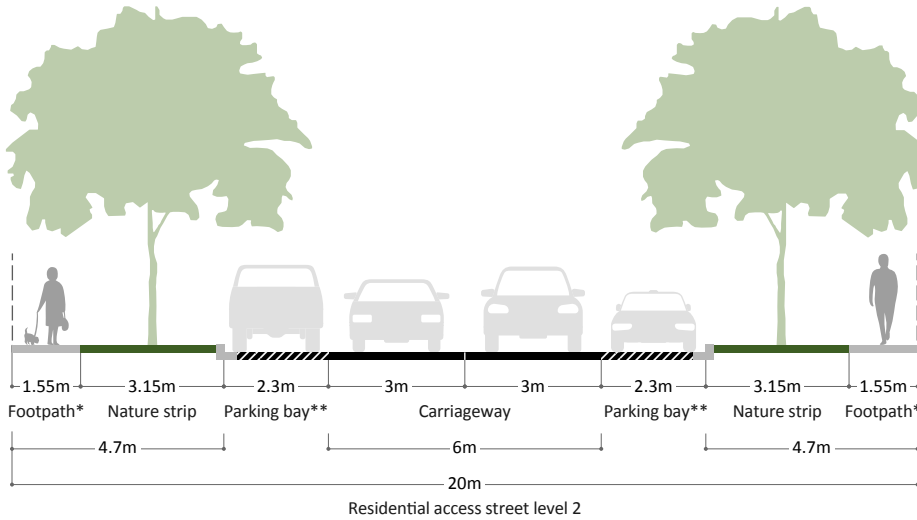


**Figure 33** Preferred residential access street level 1 cross section

#### Notes

- All standard local access streets level 1 shall have a symmetric cross section.
- The road reserve shall be widened where additional space is required within the nature strip to accommodate further services or trunk services and wider paths. No services under the pavement are permitted.
- Where an access street abuts a waterway, open space or conservation area, the road reserve width may be reduced to 14m if services can be accommodated. This cross section may not be applicable where a fire buffer is required.
- Minimum nature strip widths along waterways, open space and conservation areas must be 1m, unless street tree planting is required.
- Kerbs for local access streets shall adopt a B2 barrier kerb.

### b. Residential access street level 2



\*Including 50mm offset to title boundary

\*\*With outstands at intersections

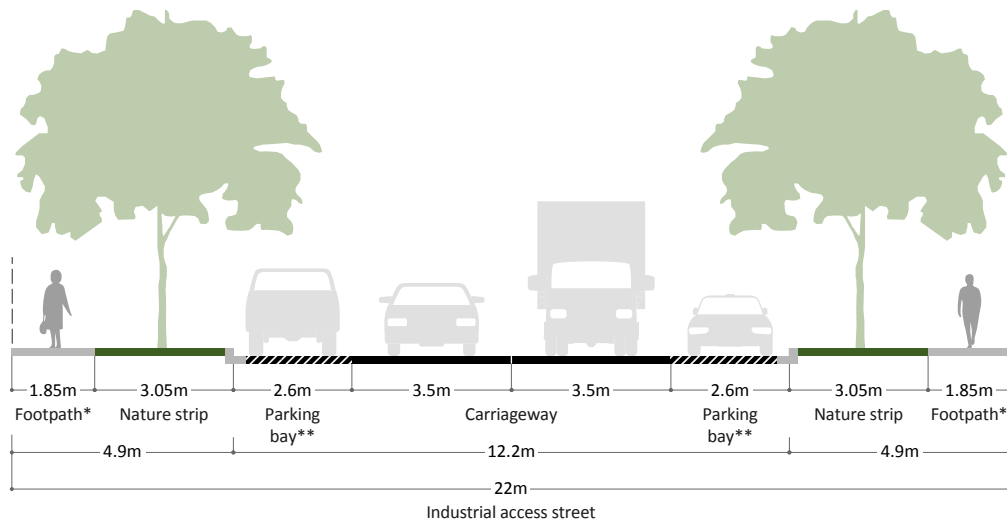
**Figure 34** Preferred residential access street level 2 cross section

### Notes

- All local access streets level 2 shall have a symmetric cross section.
- The road reserve shall be widened where additional space is required within the nature strip to accommodate further services or trunk services and wider paths. No services under the pavement are permitted.
- Kerbs for local access streets shall be a B2 barrier kerb. M2 invert channel kerbs shall not be used in between the traffic lane and indented parking lane.

## 2. ROADS AND TRANSPORT

### c. Industrial access street (<3000 VPD)



\*Including 50mm offset to title boundary

\*\*With outstands at intersections

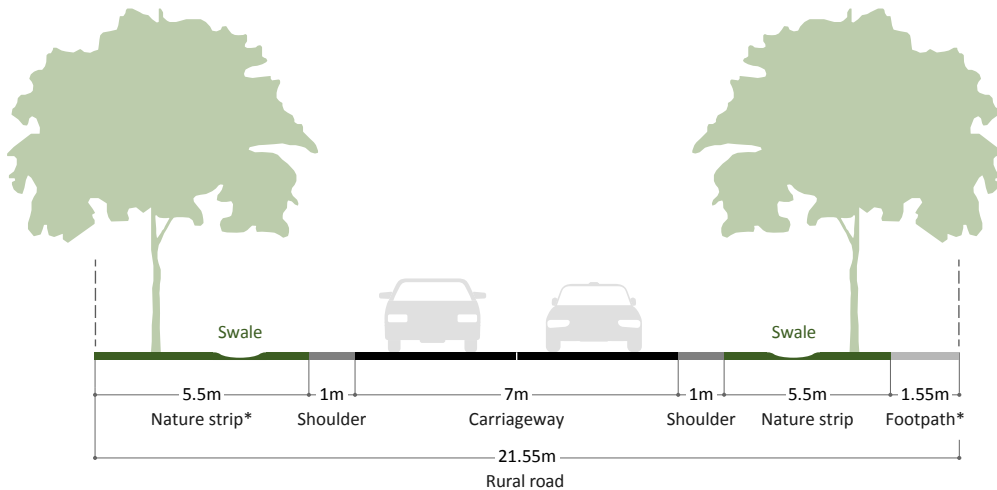
**Figure 35** Preferred industrial access street cross section

### Notes

- All industrial access streets shall have a symmetric cross section.
- The road reserve shall be widened where additional space is required within the nature strip to accommodate services. No services under the pavement are permitted.
- Kerbs for industrial streets shall be a B2 barrier kerb. M2 invert channel kerbs shall not be used in between traffic lanes and indented parking lanes.
- If a shared path is required, the road reserve width shall be 23m wide.



### d. Rural road



\*Including 50mm offset to title boundary

**Figure 36** Preferred rural road cross section

### Notes

- A footpath shall be provided on one side or as required to the satisfaction of the City of Whittlesea.
- A 1m wide spray seal shoulder or concrete edge strip shall be provided on either side of the carriageway.
- A wider road reserve may be required if swale drains are to accommodate Q100 overland flows.
- Landscaping shall be provided in accordance with the City of Whittlesea's requirements and in line with road safety requirements.

## 2. ROADS AND TRANSPORT

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### 2.2.7 Connector roads

Connector roads (or collector roads) provide traffic routes as direct as possible between each 'pocket' of a subdivision and nearby arterial roads, and places such as neighbourhood shopping centres and neighbourhood sporting facilities.

A trunk connector is considered a street carrying higher volumes of traffic than a connector street; however, similar in function to a connector in that it connects access places and access streets through and between neighbourhoods.

#### Design consideration

- Typically connector roads must contain either a two-way bicycle path, a shared path or on-road bicycle lanes.
- Traffic management devices, such as roundabouts, should be considered along lengths of a collector road at approximately 300-400m spacing to provide for U-turns, especially where there is a median within the collector road and traffic control treatments including at all intersecting collector roads. They should not be designed to attract long-distance through traffic.
- All connector roads, including those not identified as such in the PSP or relevant reference plan, must be designed for ultra-low floor buses.

### 2.2.8 Arterial roads

- Department of Transport and Planning (DTP) is the coordinating and responsible road authority for declared arterial roads.
- A new arterial road may not become a 'declared arterial road' and will therefore remain a the City of Whittlesea's responsibility. However, both existing declared arterial roads and roads identified on a Precinct Structure Plan as arterial roads must be designed and constructed to DTP standards.
- Refer to the DTP draft document [Guidance for Planning Road Networks in Growth Areas](#) for guidance on the planning and design of new arterial roads.

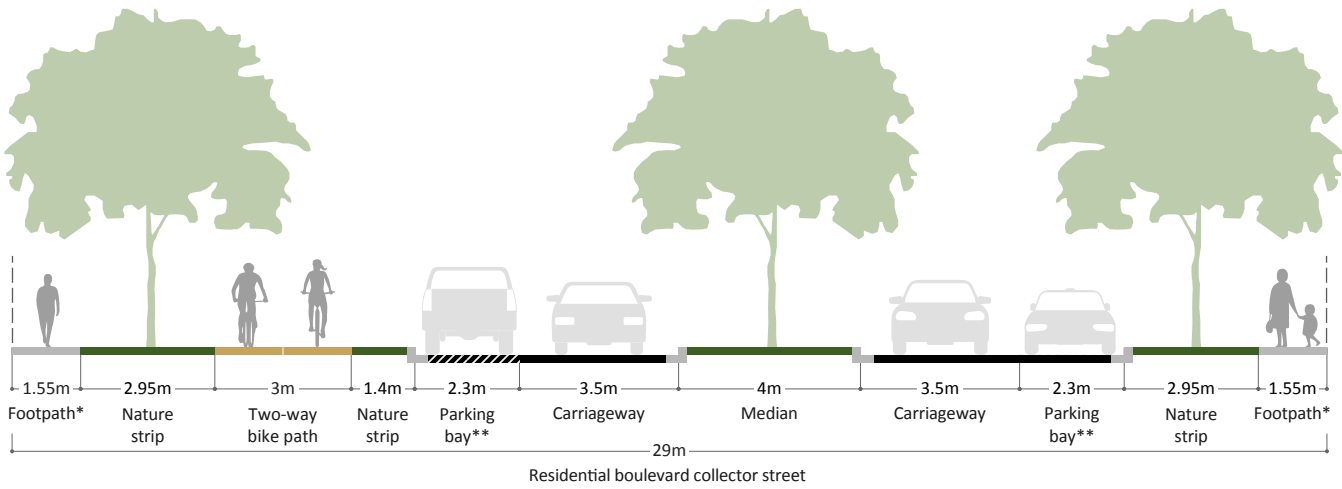
#### Design consideration

The provision of land for arterial roads, including intersection widening or flaring, may not always be shown in a public acquisition overlay for future road widening or acquisition. Irrespective of the statutory processes involved for land acquisition by DTP (or the City of Whittlesea), the Functional Layout Plan (FLP) for any subdivision abutting an existing arterial road shall include typical cross sections and a functional layout for both the current access proposal(s) and the ultimate (long-term planning) arrangement(s).

The intersection functional layouts of 'ultimate' road planning proposals are primarily for the purpose of determining road reservation requirements on a plan of subdivision. The functional layout shall also locate, where possible, initial infrastructure to best suit future improvement works. Determination of the timing and financial responsibility for the future works will be a separate process.

For details of design approval processes see the Road Types and Design Criteria Section of this document, including 2.3.3 Signalised Intersections and 2.3.4 Road Connections to Department of Transport and Planning (Roads) Assets.

### a. Residential

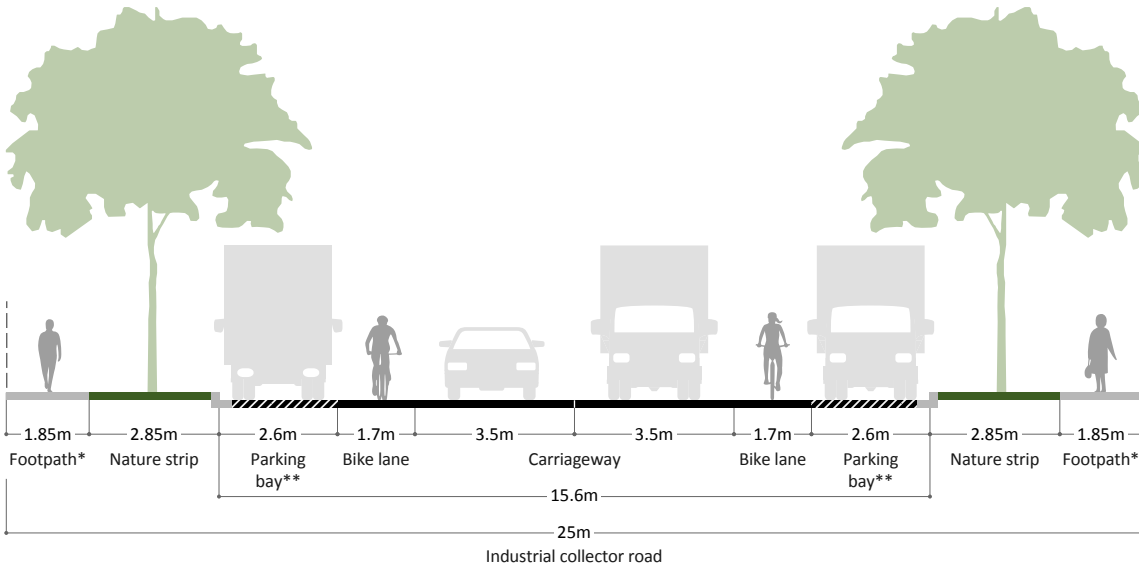


\*Including 50mm offset to title boundary

\*\*With outstands at intersections

Figure 37 Preferred residential boulevard collector street cross section

### b. Industrial (>3000 VPD)



\*Including 50mm offset to title boundary

\*\*With outstands at intersections

Figure 38 Preferred industrial collector road cross section

## 2. ROADS AND TRANSPORT

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### 2.3 Road network and intersections

The classification, function and general composition of roads (or streets) within any new residential development should be in accordance with [Clause 56 Residential Subdivision](#) of the Whittlesea Planning Scheme, the [Precinct Structure Planning Guidelines](#) (Victorian Planning Authority), or Development Plan (DP), unless specified otherwise by the City of Whittlesea.

While PSPs (and development plans in the older areas) may prescribe standard cross sections and reservation widths, the City of Whittlesea expects the elements within individual street reserves on a plan of subdivision to be performance-based and only finalised at the time of preparing a Functional Layout Plan.

#### 2.3.1 Street network

Neighbourhood permeability should be provided by using street block lengths of not more than 240m, and predominately around 200m in length. Street block lengths should generally be shorter closer to town and neighbourhood centres.

The street network at schools should be designed to provide safe conditions for school buses, and spaces for set-down and pick-up from cars.

Street extensions for adjacent future subdivision shall be provided at a spacing of no more than 240m, to facilitate a future legible network. The location of these connection points should consider the overall network requirements of the neighbourhood contemplated in the PSP.

Street connections to existing areas should ensure that traffic volumes on connected local residential streets remain commensurate with their design.

The arterial street network should be designed in accordance with the design speed parameters adopted by the City of Whittlesea and DTP.

The local street network should be planned to produce the target operating speeds referenced in the [EDCM's](#) Table 4: Road Elements.

Geometric design shall be in accordance with the maximum operating speed outlined in the [EDCM's](#) Table 2: Operating Speeds.

The street layout, street width, trees and parked cars on standard street cross sections contribute to achieving target operating speeds and users' safety. Additional measures to constrain speeds may be introduced, where warranted, such as roundabouts, traffic islands and other supported traffic management devices.

Slow points should be designed so that they do not interfere with bus access around schools or create pinch-points for cyclists. 'Road humps' are generally considered inappropriate for greenfield development and are not supported except when combined with a pedestrian or cyclist crossing or within town centres. Refer to [Guide to Traffic Management Part 8: Local Area Traffic Management](#) (Austroads).

On-street parking should be maximised in a new subdivision development. The City of Whittlesea requires that the minimum provision in urban streets shall be one (1) nominal indicative car space per residential lot within 20m of walkable distance.

Intersections between local streets and arterial routes and the spacing between intersections should be designed to reduce overloading on major intersections, and to contribute to shortened vehicle trips.

Intersections between local streets should be positioned to achieve a safe and permeable local network.

Traffic signals should be located to balance movement for through traffic with local street access where traffic volumes are high and uneven on some legs. Where traffic signals are located near a bus stop, they also facilitate pedestrian access and crossing points to bus stop facilities.

### 2.3.2 Cross intersections

The use of cross intersections on arterial and connector roads will promote connectivity for vehicles and pedestrians. Roundabouts are considered appropriate treatment for connector road to connector road intersections and all access road intersections, unless traffic volumes are uneven on some legs or pedestrian volumes require higher order traffic management techniques. Traffic signals will be required on arterial road to arterial road and arterial road to connector road intersections.

### 2.3.3 Signalised intersections

#### a. Council roads

The City of Whittlesea's process for submission and approval of signalised intersections on Council roads is described in [Appendix A9 Approval & Delivery Process for Signalised Intersections on Council Roads](#) (Council Road to Council Road Intersections). This process requires the involvement and approval of both the City of Whittlesea and DTP (Roads), noting that traffic signals are a 'major traffic control device' (MTCD) and require DTP (Roads) design and construction approval but will become a Council asset under terms and conditions determined in accordance with the planning permit.

#### b. Arterial roads

For approval processes related to intersections on declared arterial roads, refer to DTP (Roads) for advice. Note that the City of Whittlesea's review and acceptance of intersection design is required for all intersection works proposed within the City of Whittlesea prior to DTP (Roads) approval of the design. Therefore, all intersection functional layouts and design submissions, including any revisions, must be forwarded to both the City of Whittlesea and DTP (Roads) for comments.

### 2.3.4 Road connections to Department of Transport and Planning (Roads) assets

The process for distinguishing the assets of each road authority is depicted by the flow chart in [Appendix A10 VicRoads Asset Demarcation Approval Process](#) and requires the concurrent involvement of both the City of Whittlesea and VicRoads.

### 2.3.5 Roundabouts

Roundabouts and associated splitter islands shall be designed to:

- Facilitate safe pedestrian and cycle movements through treatments such as raised pedestrian crossings. The Victorian Planning Authority (VPA) draft layouts for intersections of two-way bicycle paths are encouraged to be adopted in the City of Whittlesea.
- Include landscaping. The use of canopy trees will be supported where sightline requirements are maintained. Under-storey planting must not exceed 500mm in height to maintain lines of sight.
- Avoid signage other than that associated with the safe operation of the roundabout in accordance with the relevant Australian Standard.
- Avoid lighting poles in the central island. The only lighting permitted within roundabouts is feature uplighting included as part of a coordinated urban landscape design approach approved by the City of Whittlesea. This type of lighting requires an independently metered supply which must have written approval from the power distribution authority.
- Comply with the relevant Austroads Guidelines, [Guide to Road Design Part 4B: Roundabouts](#) (Austroads) specifically AGRD Part 4B: Roundabouts.

## 2. ROADS AND TRANSPORT

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### 2.3.6 Major traffic control devices

A major traffic control device (MTCD) is a term that covers traffic signs, road markings and traffic signals that are integral to the safe and efficient use of roads. A major traffic control device places a significant and legally enforceable condition on what road users may do, and can have a significant impact on the use of a road.

Where an MTCD is proposed, and the City of Whittlesea does not have delegated authority to approve its installation, a Memorandum of Authorisation must be obtained from DTP (Roads) prior to commencement of works.

Commonly used major traffic control items which require a DTP (Roads) Memorandum of Authorisation include:

- Speed limit signage.
- A pedestrian crossing (such as a zebra crossing).
- A shared vehicle or pedestrian zone.

Refer to [Traffic Engineering Manual](#) (VicRoads) for further information on MTCDs and the approval process.

### 2.3.7 Other traffic management options

The following section provides guidance for the use of traffic management devices, noting that additional options and details are provided within the [Austroads Guides](#) (Austroads).

#### a. Vertical deflection devices

The VPA has developed draft layout plans for separated two-way bicycle path and road intersections which incorporate a raised pavement and are supported by the City of Whittlesea. Careful consideration must be given to their placement, particularly with regard to the impacts upon overland flows.

Consultation must be undertaken with the Department of Transport and Planning and/or relevant bus company when a raised pavement is to be placed on a connector road or bus route.

#### b. Kerb radius

Refer to the [EDCM](#)'s Section 10.8.4 for kerb radius specification.

The City of Whittlesea encourages the use of kerb radii less than 8m for access street-access street intersections, subject to the following:

- For *Disability Discrimination Act 1995* (DDA) compliance pedestrians must, at all times, have access to continuous accessible paths of travel (CAPT). For further details refer to the Disability Access section of these guidelines.
- Spatial requirements for turning vehicles (as per this document) shall allow swept paths to cross over the road centreline in access lanes, places and streets. Swept paths shall be clear of on-street parking spaces.

#### c. Splitter islands

Where used, the design, use and selection of splitter islands must be DDA compliant, including provision of continuous accessible paths of travel (CAPT). For further details refer to Disability Access at Section 11.4 of this document.

Splitter islands shall be designed in accordance with [Guide to Road Design](#) (Austroads). The following must be considered in designing splitter islands:

- Nominal width 1.2m (kerb face to kerb face), minimum length 3m, with SM1 kerb and suitable pavement infill.
- Setback from through carriageway is 1.5m maximum to 0.5m minimum.
- Islands are to be illuminated and delineated using line marking and raised retroreflective pavement markers (RRPMs).
- Where islands incorporate a pedestrian refuge, this will be DDA compatible.
- The design must accommodate swept paths of the design vehicle and checking vehicle as per Austroads Design Vehicles and Turning Path Templates Guide (not less than Austroads 8.8m service vehicle).
- At nominated connector road to connector road intersections, the design must allow for all bus movements.

### 2.4 Street elements

#### 2.4.1 Cross section elements

Typical cross sections used for various street types will be as per Section 2.2.6 of this document or nominated in the relevant PSP, Development Plan or Structure Plan for the area. Detailed design of the street composition shall be undertaken in accordance with the [EDCM's](#) Section 10.6.1 Cross Section Elements, which assigns typical elements to the various street types and provides minimum dimensions for those elements.

#### 2.4.2 Shared paths and bicycle paths

Shared paths are generally provided on one side of connector roads, in place of the standard footpath, for slow moving local connectivity and recreational cyclist use. Where these streets abut open space, the environment for pedestrians and cyclists can be enhanced by combining the route with the path network within the open space, provided the principal route is not deviated excessively and cross section width is retained. In these instances, the principal shared path shall be constructed to the City of Whittlesea's roadworks standard, even if shown as part of the open space landscape works.

Shared paths are often located within linear drainage reserves and along waterways. Within these zones project proposals and implementation shall be undertaken in accordance with [Shared Pathways Guidelines](#) (Melbourne Water).

Two-way bicycle paths are provided in addition to footpaths to provide an exclusive path for cyclists in lieu of on-road bicycle lanes. A two-way bicycle path is considered the preferred path type for cyclists as it caters for the full range of cyclists, including inexperienced cyclists or those wanting to avoid travelling alongside motor vehicles.

The City of Whittlesea supports the adoption of the VPA draft layout plans with a separated two-way bicycle path and road intersection as current best practice. Since the bicycle paths are a relatively new treatment and the standards and guidelines around their use will evolve with time, the City of Whittlesea and developers must be able to adapt accordingly.

The development of a pedestrian and cycle path plan is encouraged for large developments, identifying the different types of paths and how they will connect to existing areas or adjacent subdivisions. It is a requirement for developments of 10 or more dwellings or accommodation buildings, as part of a green travel plan submission (Clause 22.01) and also within PSP areas, to provide a plan that demonstrates the 'movement network'.

#### 2.4.3 Threshold treatment and footpath materials

In general subdivision areas, traditional (standard) paving materials must be used. Where raised pavements are approved for traffic management purposes at intersections, some subtle pavement edging will be allowed. Alternate materials, treatments and colours, including coloured concrete and coloured bitumen, will not be approved in these locations due to the maintenance costs incurred by the City of Whittlesea.

In activity centres and open space, alternate materials, treatments and colours may be used, but only as part of a traffic management or control device, wayfinding, an approved urban design element and landscaping. Early consultation with the City of Whittlesea is encouraged when seeking to adopt non-standard approaches.

## 2. ROADS AND TRANSPORT

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### 2.4.4 Vehicle crossings

Refer to [EDCM](#)'s Appendix D Standard Drawing for Vehicular Crossing for details. This standard is applicable, without exception, to all subdivisions having normal lot frontages and building setbacks.

Vehicle crossing locations must comply with the relevant [EDCM](#)'s standard drawing, the Australian Standards and the [Whittlesea Planning Scheme](#). Each property is to be provided with only one vehicle crossing (in urban areas).

For irregular shaped lots, requests to adopt non-standard crossing locations will be considered on their merit. However, narrow frontages limit opportunities for street trees of any size, so the absolute minimum area of nature strip between crossings, unencumbered by pits or light poles, shall be 2.5m x 2.5m. Refer to [Landscape Guidelines for Development of Private Land](#) (City of Whittlesea) for further details on planting requirements.

Industrial strength concreting, as shown in Standard Drawings, will be required for use by waste collection vehicles in dead-ends, hammerheads, court bowls and for access to laneways and the City of Whittlesea's reserves.

Adjustments to the Standard Drawings, such as strength and width, will be required where waste vehicles are required to utilise crossovers for turning movements.

Applications for an additional vehicle crossover, or modifications to an existing vehicle crossover, will be assessed on a case-by-case basis. In addition to complying with the above, the impact to on-street parking, street trees, traffic management devices, other vehicle crossovers, services and utility services pits must be considered.

### 2.4.5 Splays and arcs

Whilst splays are a mandatory Council requirement, in some instances (such as where a very wide road verge exists on the leg side of a T-intersection, or a very wide reserve width for a symmetrical pavement is proposed) it may be possible to justify no splay at all. However, splays will be required wherever there is a pedestrian path adjacent to a title boundary.

As a guide, however, the following splay dimensions (minimum at perpendicular legs) are to be specified and/or shown by the surveyor on Plans of Subdivision:

- 3m x 3m at residential street intersections.
- 2m x 2m at laneway entrances.
- 1m x 1m at footpath intersections.
- Where a dedicated bicycle path is provided a wider splay will be required to meet sight distance requirements for 30km/h bicycle speed (5m x 5m, for example).

### 2.4.6 Kerb types

Barrier kerbs (600B2) are required throughout the minor street network. Transitions to match existing profiles shall be made within the shortest possible distance and no further than the next intersection.

Footnote 5, Table C1, [Clause 56.06](#) of the Whittlesea Planning Scheme, which states: "Upright kerbs may be considered for drainage purposes or in locations where on-street parking should be clearly defined and parking within the verge is not desired" shall be applied to justify the use of B2 and B3 kerbs as a means of discouraging parking on medians and nature strips.

Mountable and semi-mountable kerbs will only be adopted where traffic safety considerations support their use (such as roundabouts, medians, traffic islands and arterial roads where no parking is generally permitted).



Mountable and semi-mountable kerbs are not a permitted component of kerb ramps, which shall be designed to AS 1428.1 (2009) – [Design for Access and Mobility Part 1: General Requirements for Access – New Building Work](#) (Simpson Building Group).

Construction of kerb ramps shall ensure compliance with the City of Whittlesea's construction standards and include the use of dowelling between kerb ramps and adjacent components, including footpaths and gutter inverts.

### 2.4.7 Fences adjoining reserves

All property boundary fencing adjoining reserves, for any given stage, including walkway extensions of road reserves but otherwise excluding road reserves, shall be erected by the developer (or landowner) at no cost to the City of Whittlesea and located entirely within the private property.

## 2.5 Disability access

### 2.5.1 Footpath and kerb ramps

Footpath and kerb ramps will be provided in accordance with the City of Whittlesea's standards and will be DDA compliant. Priority is to be given to location and alignment that support provision of continuous accessible paths of travel (CAPT).

For DDA compliance, where there is no access to CAPT, pedestrians with a sight disability shall be catered for by the installation of tactile ground surface indicators.

### 2.5.2 Tactile ground surface indicators

This brief guideline will assist in the design and use of tactile ground surface indicators (TGSI) and should be read in conjunction with relevant Australian Standards.

Use of TGSI shall be in accordance with DDA requirements and the City of Whittlesea's Strategy for Disabled Access. The use of TGSI will be minimised by designing for a continuous path of travel in order to avoid their need at minor access street intersections. Changes of footpath direction at crossings are therefore discouraged.

TGSI consist of raised ground surface texture treatments intended to provide orientation and way-finding clues for pedestrians who are blind or who have vision impairment, in order to alert, guide and assist them to move safely and independently through the built environment, including street networks.

There are two types of TGSI, warning and directional:

- Warning TGSI have flattened, domed indicators (dots) raised 4-5mm above the surrounding surface and are designed to warn of a hazard or invite a change of direction on a path of travel.
- Directional indicators have raised bars as directional guides indicating a safe route along a path of travel.

# 3. Drainage

These drainage guidelines shall apply to the provision of stormwater drainage for all forms of residential, commercial, industrial and rural developments within the City of Whittlesea as appropriate.

The objective is to ensure stormwater drainage systems designed in the City of Whittlesea operate to maximise benefits to the community based upon adequacy of design, economy of construction and a high level of safety and amenity, including provision to:

- Ensure hazardous situations do not arise on streets and footpaths.
- Ensure that all buildings in urban areas are protected against floodwaters to a similar standard to that applying in other growth areas of Melbourne.
- Limit rubbish and pollutants entering the stormwater drainage system.
- Prevent erosion and sedimentation in estate development.
- Integrate drainage works into urban planning of estate development.
- Provide for multiple use of land for drainage, recreation and transportation.

The City of Whittlesea has adopted the *EDCM*'s Section 13. The following City of Whittlesea's drainage design guidelines are supplementary to the *EDCM* and contain additional information on the provision of drainage infrastructure not covered by the agreed standards of the *EDCM*, including subdivisions in non-residential zones and other developments where drainage is a condition of a planning permit.

The City of Whittlesea is the responsible authority for all minor and major drainage works outside the authority of Melbourne Water. All new drainage works on creeks and waterways shall be to the approval of both the City of Whittlesea and Melbourne Water.

Pipe drains and associated works provided under Melbourne Water Development Services Schemes (DSS), which are to be handed over to the City of Whittlesea after Melbourne Water processes are satisfactorily completed, may be incorporated into engineering plans prepared for Council roads and drains, provided DSS extent is shown. Main drains and other infrastructure remaining under Melbourne Water responsibility, prepared on separate drawings, must also be submitted to the City of Whittlesea for comment.

## 3.1 Drainage design

### 3.1.1 Outfall drainage provision

Development that is 'out of sequence' from a drainage perspective may require works downstream of the initial stage or even beyond the limits of a developer's land holding. In all such circumstances the FLP shall provide sufficient detail to satisfy the City of Whittlesea that those works, either temporary or permanent, can be contained within easements or reserves which will be suitable for the purpose, including access for future maintenance and consent from any adjoining property owner if it is a third party.

Any part of works and assets delivered on an adjacent private property of an ultimate nature shall be transferred to the City of Whittlesea (or Melbourne Water, depending on the future owner of an asset) and will require the creation of an easement.

#### Temporary drainage work

The City of Whittlesea does not support temporary infrastructure. However, if temporary infrastructure is proposed, the following needs to be provided to the satisfaction of the City of Whittlesea:

- Written consent from any downstream landowner(s) is required for any works (temporary and/or ultimate) outside of the development site for both major and minor flows, and to discharge developed flow. Consent must be obtained prior to approval of Civil Plans; it is recommended this be sought during the Functional Layout Plan stage to avoid delays at Civil Plan approval.
- All temporary drainage assets must be free draining.
- Temporary retarding basin(s) are to remain in place until the ultimate downstream assets (such as retarding basins, wetlands and culverts) have been delivered to the satisfaction of the responsible authority.
- Maintenance of temporary retarding basins and other associated temporary drainage assets will be the responsibility of the developer for both safety and operational purposes.

- Any works and assets that are delivered on the adjoining land of a temporary nature will also be the responsibility of the developer delivering these works. A landowner agreement (licence agreement) is required between the delivery agent and the downstream property owner around ownership or maintenance responsibilities, and this agreement must be provided to the City of Whittlesea before approval of the Civil Plans. An easement must be provided for all temporary assets unless otherwise agreed to in writing by the responsible authority. A maintenance bond may be required but will be determined by the City of Whittlesea on a case-by-case basis.
- The City of Whittlesea will not accept any responsibility for the maintenance and ownership of any temporary drainage assets.
- If a Melbourne Water scheme drain leads into a temporary drain, the City of Whittlesea shall not take over the Melbourne Water drain until the drainage is connected to ultimate outfall.

### 3.1.2 Parameters

All hydrologic computations shall be in accordance with the parameters of [Australian Rainfall and Runoff \(ARR\)](#) (Geoscience Australia) – current issue. Where local confirmable information, such as flood levels for known storm events and observed flow paths of major flood events, is provided by the responsible drainage authority, this should be used in conjunction with ARR parameters.

### 3.1.3 Flood predictions

Urban drainage system design within the City of Whittlesea shall satisfy the requirements of both the Major and Minor flood predictions as defined in [ARR](#).

The flood prediction model shall take into account the layout of the proposed drainage system, including the measurement and influence of any outside catchments that contribute to the design flows, definition and measurement of sub-catchments, pipe networks and major flow routes.

## 3. DRAINAGE

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Major storm event drainage design shall apply to residential, commercial and industrial subdivision development as well as significant infill and redevelopment sites.

The designer shall be required to:

- Keep developments clear of overland flow paths.
- Set floor levels above predicted flood levels.
- Upgrade existing drains, where necessary.
- Provide reserves or constructed roads for overland flow paths.

### 3.1.4 Minor system flows

The Minor system shall include the design of the gutter, pits and pipe network capable of carrying runoff from minor storms, without flooding of gutters, surface of property or access thereto.

The capacity of the Minor system shall be designed to receive and contain, within the piped network of the property design, flows determined in accordance with building regulations and/or calculated using the parameters nominated in this guideline.

In the event that the contribution of a Minor system flow from a development exceeds the point of discharge capacity available at the downstream trunk drain, or design runoff coefficient of the drainage network, the designer shall provide an on-site detention or storage system to the City of Whittlesea's satisfaction (see Section 3.6 On-site detention systems, of this document).

### 3.1.5 Major system flows

The Major system shall comprise of both planned and unplanned drainage routes, overland, that will convey flows resulting from storms with a 1% annual exceedance probability (AEP).

The designer shall plan for roads or drainage reserves along overland flow paths. Trapped low points or sag points in road design, or downhill court bowls that could cause flooding to private property, shall be eliminated by providing specific drainage escape routes along roadways or drainage reserves. Fences, retaining walls, facilities or bridges and culverts shall not obstruct the major overland flow path.

Maximum flood depth must satisfy Melbourne Water's Floodway Safety Criteria for all residential and industrial subdivision. Maximum flood depth in a high pedestrian area, such as a town centre, shall be limited to 300mm (d<sub>max</sub>).

## 3.2 Hydrological design

Refer to the [EDCM](#)'s Section 13 for further information on hydrological design. The following provides supporting information to the [EDCM](#) for flow calculations.

The Rational Method shall be used to estimate the peak flow rates for the determination of sizes of inlets, pipe and culvert sizes and overland flow calculations.

In situations where large detention basins for flood storage are proposed, methods such as runoff routing are preferred. It is the designer's responsibility to use the most appropriate method for the particular situation under investigation.

### 3.2.1 Basis for calculations

#### a. Catchment

Boundaries of the catchment may be determined by the following methods:

- Contour maps, or
- Aerial photographs, and/or
- Field inspection/survey levels.

A Catchment Plan containing accurate contour information shall be included with the drainage computations submitted to the City of Whittlesea.

Where plans showing the location of existing drainage networks are available, these will be made available by the City of Whittlesea at current charges. Any data from such plans must be confirmed by survey if it forms part of the new design.

The designer shall take into account future road patterns where the contributing catchment includes areas subject to future development.

Where the contributing catchment includes existing subdivision areas, the location of existing drainage systems, and the catchment associated with the drainage network being designed, shall be included in the computations.

#### b. Runoff coefficient

Refer to the [EDCM](#)'s Section 13.7.

For subdivisions, the fraction impervious to be adopted from Table 16 of the [EDCM](#) and the coefficient of runoff for the type of development category shall be determined.

For buildings and other development on individual property where the provision of drainage is a requirement of the planning permit, the fraction impervious shall be calculated and the AEP selected for the appropriate development category in Table 16, 'Land Use Fraction Impervious' of the [EDCM](#).

#### c. Rainfall data

[ARR](#) procedures shall be used to calculate rainfall intensities for the relevant location.

Intensity-Frequency-Duration curves (IFD) are available from the [Bureau of Meteorology's website](#).

#### d. Annual exceedance probability

The design AEPs outlined in Table 14 of the [EDCM](#) shall be used for drainage design.

### 3.2.2 Time of concentration

The maximum time to be adopted for flow travel from sub-catchment to point of entry into the drainage system shall be as per Table 1 of this guideline.

Note that the City of Whittlesea has provided additional and some minor variations to the time of concentrations adopted within Table 15 of the [EDCM](#).

### 3. DRAINAGE

Development category	Maximum time of concentration ( $t_1$ )	Average recurrence interval
<b>Minor system</b>		
<b>Road reserves</b>		
Access lane/place/street	5 minutes	5 years
Connector/arterial road	6 minutes	5 years
<b>Residential lots</b>		
Area up to 450sm	5 minutes	5 years
Dual occupancy	5 minutes	5 years
Area 451 – 4000m <sup>2</sup>	7 minutes	5 years
<b>Public open space</b>		
Parklands up to 4000m <sup>2</sup>	7 minutes	5 years
Parklands > 4000m <sup>2</sup>	Calculated	5 years
<b>Other uses</b>		
Retirement living sites	Calculated	5 years
Multi-unit dwelling sites	Calculated	5 years
Industrial/commercial sites	Calculated	10 years
<b>Public facilities</b>		
Civic centres	Calculated	50 years
Educational	Calculated	50 years
Halls	Calculated	50 years
Hospitals	Calculated	100 years
Aged care facilities	Calculated	100 years
Pre-schools	Calculated	100 years
<b>Major system</b>		
Catchment < 60 Ha	Calculated	City of Whittlesea's criteria
Catchment > 60 Ha	Calculated	Melbourne Water's criteria

Table 1 Times of concentration

### Partial area effect

The designer shall be responsible for ensuring possible 'Partial Area Effects' are taken into account when calculating peak flows using the Rational Method.

## 3.3 Pipeline flows

Refer to Section 13.9 of the [EDCM](#).

Where the outfall is an existing pipe network and more accurate information is not available, the tailwater level shall be taken as 300mm below either:

- Invert of kerb and channel for drains in roads, or
- Existing surface in easements and open space.

The City of Whittlesea may require the information to include section(s) downstream to confirm the hydraulic assumptions.

## 3.4 Pit criteria

Inlets to the drainage system shall be designed to capture and limit the width of gutter flows to acceptable dimensions resulting from the design minor rainfall event and to ensure pedestrian kerb ramps remain 'dry'.

### 3.4.1 Pit design criteria

- Pits shall be used for all pipe junctions (other than property connections), increases in size, changes of direction and at the start and end of curved pipelines.
- For pipelines 1050mm in diameter and larger, the City of Whittlesea's approval may be granted for maintenance access points to be more than 90m apart, in accordance with Melbourne Water practice for large diameter pipelines.

- For all new road construction, grated entry pits (GEPs) shall be provided. Old style side entry pits (SEPs) may only be used for the modification of existing pipelines. Pits may be precast providing they are single units in accordance with the Standard Drawings.
- Junction pits (JPs) with dimensions greater than shown on Standard Drawings shall be in accordance with applicable Melbourne Water standards.
- Pit inverts shall be profiled to shape with mass concrete to match the outfall pipe in accordance with Standard Drawings. Where deflectors are proposed, they shall be detailed on the plans as variations to the Standard Drawings for approval.

### 3.4.2 Kerb inlet design

Hydraulic criteria for entry design of GEPs vary and shall be investigated for specific cases where appropriate, including the following:

- Inlets at trapped low points in streets shall be double entry (or triple where necessary) and shall be designed as an orifice with a 50% safety factor. When considering this condition, the head required to achieve design flow or capture shall be within permitted safety limits.
- At trapped low points, the effects of total inlet blockage and/or by-pass shall also be evaluated to ensure the level of flood waters, in relation to footpaths and properties, meets safety and freeboard requirements. Saw-tooth grading of road shall be limited at more or less 0.5%.
- Where a standard pit, on grade, is insufficient to capture the full flow, the designer shall either:
  - Reduce the pit spacing, or
  - Provide multiple entry pits (double or triple).

## 3. DRAINAGE

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### 3.5 Surface drainage

Refer to the [EDCM](#)'s Section 13 with the following supporting guidance.

#### 3.5.1 Protection from natural sheet flows

Property adjacent to large areas of open space and planning zones that preserve the natural catchment conditions shall be protected from surface runoff, either occurring as sheet flow or concentrated by minor contour changes.

Swale drains and other drainage infrastructure shall be provided along the high side of the development and be appropriate for the natural conditions, including the provision of access for maintenance. Easements shall be provided for swale drains to notify future residents not to alter swale drain levels.

Lots sloping to the rear are to have grated junction pits at certain locations to minimise overland flow to downstream property.

The designs shall cater for a 1% AEP design storm event with a minimum 150mm freeboard.

#### 3.5.2 Floodways in drainage reserves

Floodways in drainage reserves shall be designed for both Minor and Major storm criteria. Finished levels of new development adjacent to floodways shall provide a minimum 600mm freeboard above the 1% AEP design storm.

Provision for pedestrian access in reserves (shared paths) shall be consistent with the safety criteria for the predicted flood extent. Depth and velocity of flow at paths, crossing structures and intersecting streets shall be within limits contained in the [Floodway Safety Criteria](#) (Melbourne Water). Also refer to [Shared Pathways Guidelines 2009](#) (Melbourne Water).

#### 3.5.3 Pipeline criteria

- Fibre-reinforced concrete (FRC) pipes shall be used. All pipes, pipe laying, bedding and backfilling shall conform to the relevant Australian Standards and the City of Whittlesea's specification for road and drainage construction.
- Connections to open waterways, for which Melbourne Water is the responsible authority, shall be in accordance with the requirements of Melbourne Water. Pipelines upstream of that connection will not be approved by the City of Whittlesea without evidence of Melbourne Water's approval being provided.
- Connections to open waterways, for which the City of Whittlesea is the responsible authority, shall be designed to:
  - Be free draining
  - Be angled downstream
  - Have drops, from pipe invert to normal receiving tailwater, of not more than 300mm
  - Limit exit velocities to the values specified in the Melbourne Water Land Development Manual (LDM).
- Drains within the road reserve shall be located on the high side of the road, unless specifically approved otherwise during assessment of the Functional Layout Plan.
- Nature strips in new subdivisions shall not grade towards private property. In existing roads where the 'reverse fall' on a nature strip must be retained, the hydraulic grade line (HGL) of the drainage line shall be at least 300mm lower than the top of any pit grate in the footpath cut-off drain.
- Anchor blocks shall be spaced as per SD214.



### 3.5.4 Property connections

The following is provided in addition to Section 13.21 of the [EDCM](#).

- Generally, unless otherwise required and approved in advance of design submission, only one outlet from the internal stormwater system of a property will be permitted to connect into Council drainage.
- Stormwater connections, other than a standard 100mm property connection from a single dwelling site, shall be sized for full development of the property, in accordance with these guidelines, using a pipe laid at minimum slope.
- All industrial properties and other similar development sites shall be provided with a junction pit, inside the property boundary, suitable for the connection of all internal drainage. Minimum 225mm diameter pipe shall be installed.

### 3.5.5 Subsurface drainage

Refer to the [EDCM](#)'s Section 13.24 Subsurface Drainage.

## 3.6 On-site detention systems

Generally, multi-dwelling, commercial and industrial building development on a property, for which the existing drainage is inadequate by current standards, will require an on-site stormwater detention (OSD) system. An exemption may be granted where there has been an investigation, to the satisfaction of the City of Whittlesea, which proves that existing Council drainage for the property is designed for the likely total area of hard surfaces and is therefore adequate.

Where OSD is required, the system must be sited within the boundaries of the property and clear of any proposed building or easements serving other property, including Council drainage or other authorities' use. The system must be designed in accordance with the following requirements and the computations of the proposed system must be submitted for approval.

AEP = 10% (for discharge control and storage)

$C_{(pre-development)}$  = 0.35 (or higher value provided by the City of Whittlesea)

$C_{(post-development)}$  = As determined in accordance with the City of Whittlesea's guidelines

An 'orifice plate' type control pit with overflow weir or baffle wall, multi-cell device or other approved flow restriction system is to be used. Orifice shall be designed in accordance with Section 3.6.3 Flow Control Outlet.

### 3.6.1 Design parameters for on-site detention

To protect the capacity of the existing drainage system, the on-site stormwater detention system needs to be designed based on estimates of flows from the site. The document provides details of how these calculations shall be done. The design parameters for an OSD system include:

- Site area.
- Base case (predevelopment) fraction impervious of 0.35. The City of Whittlesea may adopt a higher value when the existing Council drainage is known to have been designed using a value greater than 0.35. The City of Whittlesea will provide this information as part of a Legal Point of Discharge (LPOD) application.
- Proposed fraction impervious, based on all planned impervious surfaces, including paving.
- Site time of concentration, to be determined by the designer.
- Catchment time of concentration (the City of Whittlesea reserves the right to nominate this value).
- Flow travel time from site to catchment outlet (the City of Whittlesea reserves the right to nominate this value for 'OSD4' calculations).
- Rainfall intensity, to be determined by the designer in accordance with the City of Whittlesea's Drainage Guidelines.
- Annual exceedance probability (AEP), as nominated in these guidelines.

## 3. DRAINAGE

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### 3.6.2 Key aspects of an on-site detention system

There are two elements that need to be determined for a site from the above parameters. These are:

- a. Permissible Site Discharge (PSD).
- b. Site Storage Requirement (SSR).

The PSD is based on a 20% AEP (Q5) storm. Most Council drains in residential areas were designed for a 20% AEP (Q5) peak flow. The aim of the PSD is to limit the site discharge to ensure that existing Council pipe drains do not surcharge more frequently as a result of site redevelopments.

The SSR is based on a 10% AEP (Q10) storm. All high density residential, commercial and industrial areas are designed for a 10% AEP (Q10), in accordance with ARR. The City of Whittlesea has therefore set the storage requirement to ensure new OSD systems do not overflow to Council drains and compromise their 10% AEP (Q10) design capacity. The requirement for an SSR based on the 10% AEP (Q10) storm also allows for an increased volume and duration of runoff from the redeveloped site and the possibility of this delayed flow coinciding with the peak flow from the larger catchment.

### 3.6.3 Design details of on-site detention systems

The site drainage system is to be designed to collect runoff from the whole site, including all pervious and impervious areas, and direct it to the site storage area in accordance with accepted plumbing requirements. All surface inlets must have suitable grates to prevent blockages of the underground drainage system.

#### a. Site storage system

The site storage is required to temporarily store rainwater during a storm, while the flow out of the storage is controlled.

Storage shall be provided below ground in a fixed storage system that is free draining. Pipes used for storage must be laid at a minimum slope of 1 in 200.

For developments of significant size (such as retirement villages), where topography and space permit, the City of Whittlesea may allow that part of the site storage volume in excess of the 20% AEP (Q5) may be provided above ground. Any such above ground storage shall satisfy the following:

- Contained without the possibility of overflowing beyond the site.
- The maximum storage depth in a paved area shall be 150mm.
- Storage above permanent water features shall meet safety requirements elsewhere in these guidelines and not interfere with their normal function.
- No landscaped area shall be used which, over time, may be reshaped.
- A design plan, longitudinal section and cross sections of the proposed storage shall be included as part of the drainage approval submission.
- The maximum water level of any site storage is to be at least 300mm below all habitable floor levels on site.

#### b. Flow control outlet

The flow control outlet is to be located between the site storage and the Council drainage system. The outlet is to be designed to limit the flow to the Council drainage system to the PSD when the storage is at the SSR.

The minimum control orifice design size shall be 63mm in diameter. Where the orifice is less than 90mm in size, a suitable mesh screen must be installed to prevent blockages.

Overflow from the flow restriction device must be taken into account when designing the outlet, to allow for unplanned events such as gap flows or blockages. The overflow weir or plate shall be at least 300mm upstream of the outlet pipe and have a minimum clearance of 100mm from the underside of any cover.

Outlet and storage are to be accessible for both maintenance and regular checking for blockage without the need to enter a confined space. This shall be achieved by not making the system too deep and by having sufficient access from the surface. Step irons will be required to comply with the City of Whittlesea's standards for drainage access.

All storage facilities and the control outlet must have a signage plate attached (as per SD826) and be located clear of buildings and outside easements designated for Council drainage or other authorities' use.

### 3.6.4 Calculations to be submitted

Calculations of peak stormwater flows from small urban sites may be done manually or using the proprietary program OSD4.

#### a. Manual calculations

The PSD is to be calculated using the following parameters:

- Base Case Site Fraction Impervious ( $f_b$ ) = 0.35.
- Annual Exceedance Probability (AEP) = 20% (Q5).
- Catchment time of concentration ( $T_c$ ).  
The City of Whittlesea reserves the right to nominate this value.

The SSR is to be calculated using the following parameters:

- PSD.
- Site time of concentration.
- Planned site fraction impervious.
- Annual Exceedance Probability (AEP) = 10% (Q10).

A range of storm durations needs to be considered to calculate the SSR. Typically storm durations from six minutes up to approximately two hours will need to be considered to determine the maximum storage volume required.

#### b. OSD4 computer program

Calculations of PSD and SSR values using OSD4 are accepted provided the submitted design is accompanied by print-outs showing all data inputs and outputs.

Inputs used for catchment time of concentration ( $T_c$ ) and travel time to outlet ( $T_{so}$ ) must be obtained from Council.

## 3.7 Drawing submissions

All submissions for approval shall include the following information on the drawings:

- Catchment plan(s) of all sub-catchment areas (in Ha) and inlet points (pits numbered), consistent with detail plans and readily identified, by inspection, with content of drainage computations.
- External catchment boundaries shown to scale on a topographic plan.
- All new drains and any existing outfall drain(s) as required, including hydraulic gradient determination.
- Hydraulic grade lines plotted to scale on each pipe on longitudinal sections, including 1 in 100 scale drawing(s), where applicable.
- Pit loss coefficients at each pit location on longitudinal sections.
- Tailwater level at outfall and flow velocity.
- Pipe longitudinal grades and capacities (running full and design flow).
- Pipe diameter, material, class and backfilling.
- Other authority plans and/or approvals for proposed works impacting upon drainage.
- Melbourne Water DSS (Pipes) – Engineering plans and design verification, including drainage network with catchments less than 60 Ha to the City of Whittlesea's standards.
- Melbourne Water DSS (Waterway, Ponds and other WSUD assets) – Engineering plans, design verification, wetlands vegetation design, Maintenance Plans showing asset ownership and a detailed maintenance program meeting the City of Whittlesea's requirements.
- Temporary outfall and/or treatment train, consistent with an approved FLP, including a detailed maintenance program meeting the City of Whittlesea's requirements.
- Line of demarcation between Melbourne Water and Council drainage assets.

# 4. Roadworks Design

Roadworks shall be designed in accordance with the *EDCM*'s Sections 10 and 11. Additional details are provided within this section for clarification of requirements and/or alternatives not covered by the *EDCM*.

### 4.1 Documentation

Documentation that is required to accompany an Application for Engineering Plan Approval is summarised in the application form (in [Appendix B2](#)).

For greater detail of supporting information which shall accompany the engineering construction plans, refer to the Development Approval Checklist, Parts D1 to D8 (in [Appendix B3](#)).

### 4.2 Geotechnical investigation and testing

#### 4.2.1 Site investigation

The [General Practice Note – Potentially Contaminated Land, June 2005](#) (Department of Sustainability and Environment), which is designed to provide guidance for planners and applicants about how to identify if land is potentially contaminated, must be followed for all residential land being subdivided, commencing with levels of assessment recommended in Table 2 – Assessment Matrix.

An assessment shall also be undertaken and reported upon, in conjunction with geotechnical testing for road subgrades, of the potential for the existence of filling over any part of the site beyond the proposed road reserves.

#### 4.2.2 Geotechnical testing for road subgrades

Investigation and testing of subgrade materials and conditions prior to the design of road pavements within the City of Whittlesea shall be conducted in accordance with the [EDCM](#)'s Section 11.

Additional information is provided below to complement, without taking precedence over, the [EDCM](#).

Substantial areas of the City of Whittlesea consist of weathered basalt formed from the Newer Volcanics of the Western Plains of Victoria. The weathering of these basalts has typically resulted in surface silts, underlain with firm to stiff residual clays, which grade to weathered basalt at depth. Many new urban subdivisions will therefore be in areas of highly expansive clay subgrades that are susceptible to environmental movement during seasonal moisture changes and loss of strength due to water ingress. With a desire to simplify design and standardise construction, appropriate pavement and capping layer compositions have been derived in the [EDCM](#) for these highly moisture-dependent subgrades.

Evaluation and classification of subgrade soil types is prescribed in Section 11.5 of the [EDCM](#).

VicRoads' [Code of Practice RC500.20: Assignment of CBR and Percent Swell to Earthworks Fill and Pavement Materials](#) is to be used in field investigation using Scale A (design AADT >10,000 VPD) and Scale B (design AADT <10,000 VPD).

#### 4.2.3 Proof roll testing

The proof roll test remains the most practical acceptance test for subgrade stability and shall be applied to all pavement subgrades. The acceptance criteria shall be when an area withstands test rolling without rutting and with only minor visible deformation and springing.

Areas failing proof roll tests require re-treatment until accepted by the City of Whittlesea's Surveillance Officer.

## 4. ROADWORKS DESIGN

### 4.3 Pavement design

Road pavements within the City of Whittlesea are to be designed in accordance with the [EDCM's](#) Section 11.

Deep lift or full depth asphalt is required for all Council roads that intersect an arterial road or any roundabouts on collector roads.

Road pavements for industrial development shall use the following design parameters:

Road type	AADT (vpd)	% HV	Growth rate	Traffic lane	Lane distribution
Access	<3000	30%	2%	2	1
Connector	>3000	30%	2.5%	2	1

**Table 2** Pavement design parameters for industrial development

Asphalt pavement for industrial subdivision:

	Pavement type	Road type	
		Access street	Connector road
Wearing course	Size 14 type H asphalt	40mm	40mm
Intermediate course	Size 14 type H asphalt (or better)	Varies	Varies
Base course	Size 14 type SI asphalt (or type SS)	75mm	75mm
Subbase	Cementitious and/or unbound materials	Varies	Varies
Lower subbase	Granular material	Varies	Varies
Capping layer <sup>1</sup>	Type A capping layer material	Varies	Varies
Construction layer <sup>1</sup>	Capping layer material	Varies	Varies

<sup>1</sup>Pavement on expansive subgrades must have capping and construction layers. Minimum thickness to be 150mm. ([EDCM's](#) Section 11.5.5 and 11.5.6)

**Table 3** Unbound granular pavements on expansive subgrade

## 4.4 Signage and line marking

A separate signage and line marking plan shall be submitted accompanying all Civil Engineering Plans. The plan shall show the road layout of the entire stage(s) or site, signs, line marking and RRPMs for the development, including a sign schedule for all signs.

Signage and line marking plans must comply with the relevant standards and guidelines. Key reference documents include: The Australian Standards (AS 1728.1 – *Manual of uniform traffic control devices Part 1: General introduction and index of signs*; AS 1728.2 – *Manual of uniform traffic control devices Part 2: Traffic control devices for general use*); [Traffic Engineering Manual](#) (VicRoads); [Road Design Notes](#) (VicRoads) and [Austroads guidelines](#).

All pavement markings must be long-life thermoplastic type.

### a. Intersections

Intersections of lanes and access places/streets with access places/streets will be self-regulating and will not require advisory traffic signage. Otherwise, all traffic management signage and line marking shall be to Australian Standards.

Perimeter line marking must be provided around the central islands of roundabouts and traffic islands.

### b. Street network

Centre line marking must be provided on collector roads.

Edge lines between travel lanes and indented parking bays will be required on higher order roads where not defined by a concrete invert (or edge strip).

### c. On-road bicycle lanes

On-road bicycle lanes will be both signposted and line marked. Green surface treatment for on-road bicycle lanes must be used in areas of conflict with motor vehicles in accordance with AS 1742.9 [Bicycle Facilities](#) and other supporting documents. The green surface treatment must comply with the following:

- VicRoads Standard Section 430 for *High Friction Surface Treatments*.
- The preferred colour is G13 Emerald (AS2700 S *Colours Standards for General Purposes*).

### d. Shared user paths, bicycle paths and separated paths

Shared user paths, bicycle paths and separated paths must be signed at the beginning of the path, immediately after each road crossing and elsewhere such that the spacing does not exceed 500m. Also consider regulatory signage to avoid any overuse.

Any signage used for shared paths, bicycle paths and separated paths may require the use of 'special' size (in accordance with AS 1742.9).

### e. Temporary discontinued roads

A 'Road Closed' sign (G9-20) must be provided at all temporary discontinued or closed roads and must be combined with an 'Obstruction Marker' sign (D4-5).

# 5. Design of Structures

The City of Whittlesea requires the preparation and submission of plans of structural items for subdivisions and other forms of development wherever the works are to be handed over to the City of Whittlesea upon completion. The requirements of the *EDCM*'s Section 15 Structural Elements, also apply and are embodied herein.

When an item of infrastructure, whether part of the road and drainage works or hard landscaping, contains any structural element, the following criteria shall be satisfied.



### 5.1 Design certification

All structures delivered as part of development works, that will remain on private property, will require a building permit and designs shall be carried out by a qualified structural engineer and certified by a Registered Building Practitioner in accordance with the [Building Code of Australia](#) (BCA).

Structures that will be handed over to the City of Whittlesea require design and construction certification from a qualified engineer who has relevant experience in the required field of practice. For works that are a component of road and drainage infrastructure, only those engineers who are currently registered on the DTP (VicRoads) register of pre-qualified contractors and consultants, within an appropriate category and pre-qualification level, are eligible to provide design and construction services.

Design certification shall be provided prior to the City of Whittlesea's approval of the plans. The construction of works shall be inspected by a qualified structural engineer or Registered Building Practitioner and construction certification shall be provided prior to the City of Whittlesea accepting responsibility for future care and maintenance.

### 5.2 Concrete pavements

Trafficable pavements for access lanes/paths shall be designed and constructed in accordance with the publication *Guide to Residential Streets and Paths (C&CAA T51 – 2004)* (Cement, Concrete and Aggregates Australia).

Trafficable pavement designs must be submitted to the City of Whittlesea for review and approval.

Joint construction details for trafficable pavements, including spacing and type, shall be in accordance with *C&CAA T51 – 2004* and shown on the drawings. The pouring sequence shall be prescribed on the drawings for all extended areas of paving, including road pavements, as recommended for the mitigation of shrinkage stress cracking.

Trafficable rigid pavements for higher order streets shall be in accordance with [Code of Practice RC500.22: Selection and Design of Pavement and Surfacing](#) (VicRoads) and [Guide to Pavement Technology – Part 2: Pavement Structural Design \(AGPT02\)](#) (Austroads).

Concrete type and grade shall be clearly stated on the drawings.

Concrete laneways must have minimum 200mm thick N25 concrete with SL82 mesh top 50 cover.

### 5.3 Standards

The design of bridges and culverts shall satisfy the requirements of the [EDCM](#)'s Section 15.4 Bridges.

In the absence of information in the [EDCM](#), these structures shall be designed in accordance with the principles, practices and procedures of the [Guide to Bridge Technology](#) (Austroads) and [Bridge Technical Notes](#) (VicRoads). The relationship between Bridge Technical Notes, AS 5100 and the Austroads Guide to Bridge Technology is summarised in the [VicRoads Supplement to the Austroads Guide to Bridge Technology](#) (VicRoads). Construction shall comply with VicRoads Standard Specification.

## 5. DESIGN OF STRUCTURE

All loading assessments, material specifications, other design inputs and methodologies, not otherwise specified by the City of Whittlesea's guidelines, shall be in accordance with the applicable Australian Standards. Design criteria shall be based upon the following:

- [Bridge Design Code: AS 5100](#).
- [Steel Structures: AS 4100](#) (SAI Global).
- [Concrete Structures: AS 3600](#) (Standards Australia) or [AS3600 \(Incorporating Amendment Nos 1 and 2\) Australian Standard® Concrete](#) (Studocu).
- [Timber Structures: AS 1720.1 SAA Timber Structures Code – Part 1: Design Methods](#)  
(Note: All timber grades and types adopted must be in accordance with the durability criteria as directed by the City of Whittlesea or as specified in the applicable Standard) (SAI Global).
- [Structural Design Actions General Principles: AS 1170](#) (SAI Global).
- Maintenance requirements and methods to be detailed and submitted.
- Design life of structures as per Table 4.

### 5.4 Materials

Materials with demonstrable environmental benefits are strongly encouraged, provided that the material is proven to meet all its functional requirements with little or no impact on cost, maintenance and durability.

A small cost impost will be considered if there is a proven reduction in embodied energy, toxicity, or other environmental impact over the course of the materials' lifecycle.

All non-standard materials must be pre-approved by the City of Whittlesea.

Structure type	Design life
General	25 years (unless otherwise directed by the City of Whittlesea in writing)
Bridges/culverts/structures supporting road infrastructure	100 years
Pedestrian bridges	50 years
Temporary structures	To be discussed with the City of Whittlesea
Stormwater pits	50 years
Retaining walls – concrete	50 years
Retaining walls – rockwork	50 years
Council building structures (such as shelters in parks)	50 years

**Table 4** Design life criteria

### 5.5 Retaining walls

The following design and construction guidance must be followed when proposing installation of a retaining wall within a development:

#### Design consideration

- All retaining walls shall be designed and constructed in accordance with *Building Act 1993, Building Regulations 2018, Building Code of Australia, Australian Standards* and other relevant guidelines.
- The City of Whittlesea's preference is for earthwork batters to be provided adjacent to existing or future public space (including road reserves and parks, for example). Where the slope of the batter is steeper than 1V:6H and fill height is more than 500mm, a retaining wall that does not exceed 1m in height can be considered. However, it is recommended that retaining walls be installed within the private lots to avoid encroachment into the adjacent public space.
- Retaining walls shall not be installed:
  - along drainage reserves
  - within drainage easements (excluding straight crossing).
- Retaining walls along road reserves and between lots and public open spaces shall be of grouted rock masonry construction and located entirely within the private property. Concrete sleeper retaining walls can be used between lots. Batters should be provided adjacent to road reserves on the lower side rather than retaining walls.
- All footing and associated works including Ag (agricultural) drains and backfill for the retaining walls along the road reserve must be fully contained within private property.
- A barrier or fence is required to be constructed as part of civil works to safeguard pedestrians from falling, where the height of the retaining wall exceeds 1m along the road reserve and public realm.
- The height and alignment of retaining walls at driveways and property splays must consider pedestrian visibility requirements as per Australian Standards and Austroads guidelines.

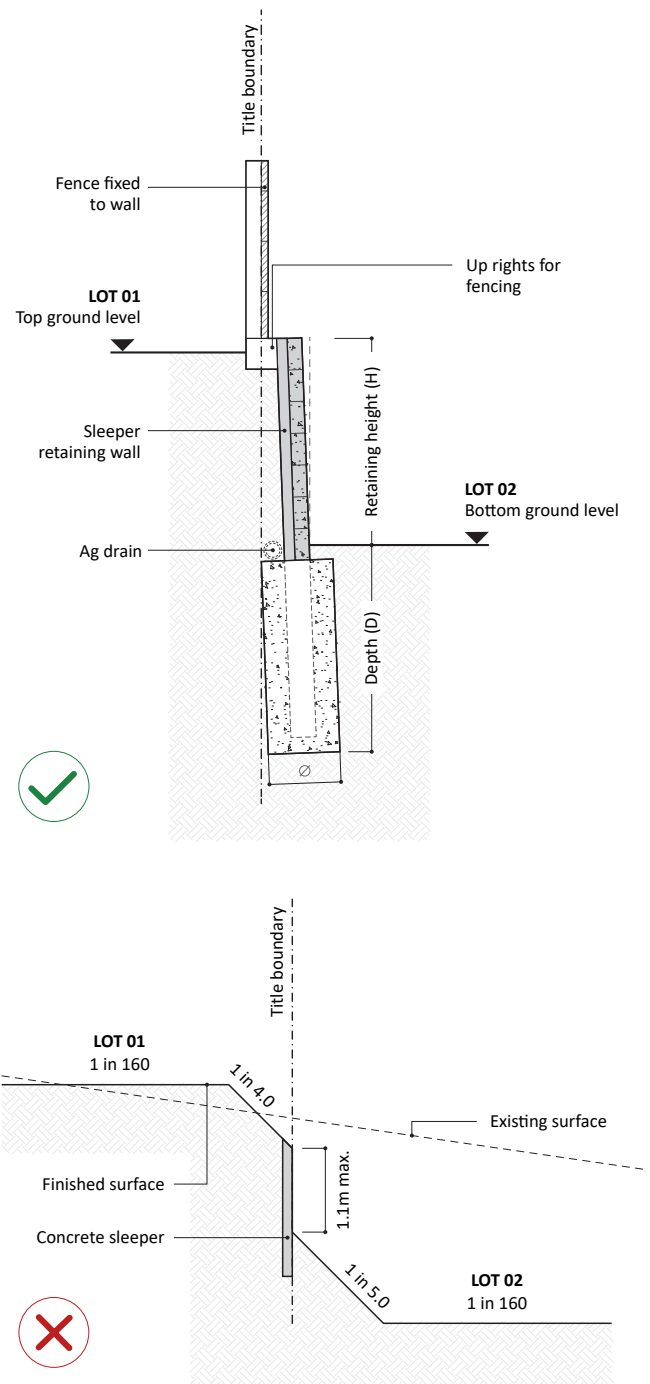
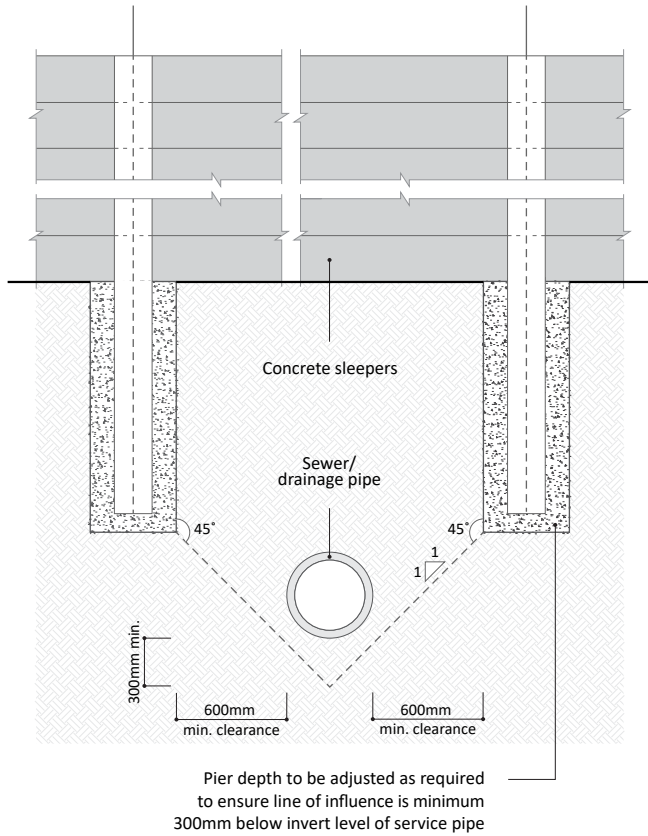


Figure 12 Retaining wall typical section

## 5. DESIGN OF STRUCTURE



### Notes

Catch drains shall be designed and installed along the high side of a retaining wall to prevent overland flow overtopping the wall.

### Documentation

- Certificate of Compliance – Design must be provided for retaining walls, prepared by a suitably qualified and experienced structural engineer prior to approval of plans.
- A copy of the structural computations must be provided for the design of the retaining walls. Design criteria and parameters used for the structural elements must also be provided with the computations.
- A building permit must be obtained for any structure or retaining wall exceeding 1m in height prior to commencement of construction, in accordance with the Building Code of Australia. Copy of building permits and Certificate of Compliance – Construction (regardless of height) are to be submitted to the City of Whittlesea prior to the request of a Statement of Compliance.

Figure 13 Retaining wall along easement

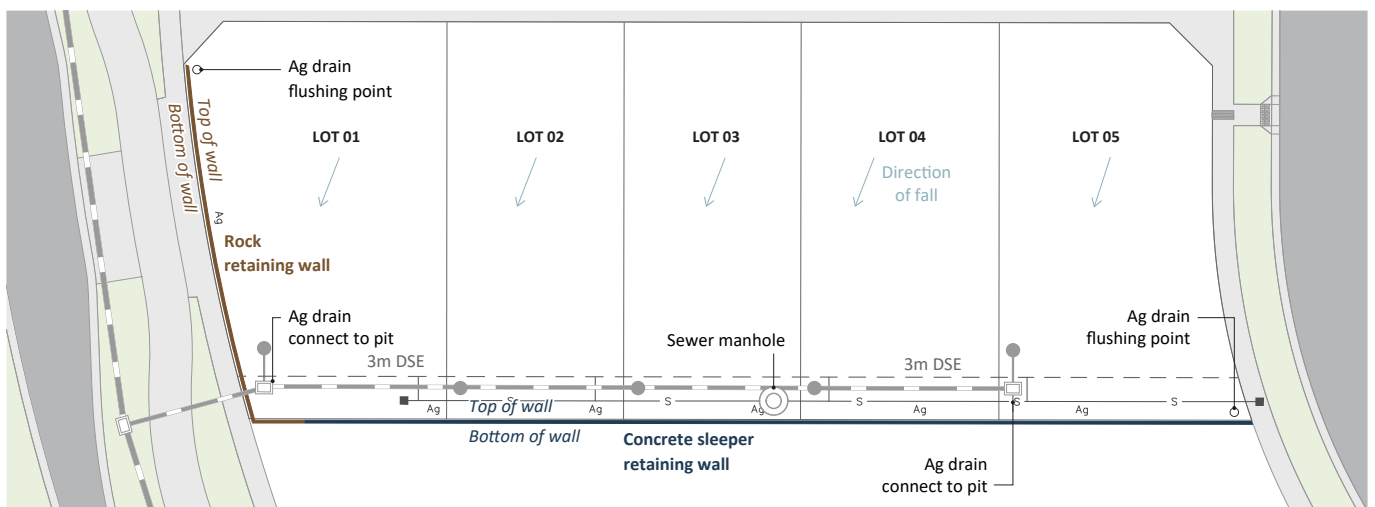


Figure 14 Different type of retaining wall and Ag (agricultural) drain connection points

### 5.6 Plan submissions

#### Drawings and documentation

Design certificates and a copy of structural computations, a geotechnical investigation report and design criteria for each structural element clearly shown must be provided with the plans submitted to the City of Whittlesea. The sheet size and number of copies of plans for submissions shall be in accordance with the City of Whittlesea's general engineering approval requirements and submitted with the standard application form.

Engineering designs for civil and structural works within open spaces, parks and reserves which are submitted in a package with landscape works (such as shelters, pergolas, street furniture and art supporting structures) must be presented on a separate plan(s) indicating all construction details but excluding cladding or architectural details, additional finishes and 'soft landscaping' details.

### 5.7 Steelwork

Pre-welded (shop-welded) steelwork connections or bolted connections are required by the City of Whittlesea.

On-site welding is not acceptable unless demonstrated that there is no other connection method possible. All site welds are to be cold galvanised on site.

All exposed steelwork finishes must be hot-dip galvanised.

### 5.8 Foundations

Copies of geotechnical engineering reports must be provided with the foundation computations.

Bearing capacity and depth requirements for foundations must be specified on the plans and verified on site by a pre-qualified geotechnical engineer. Copies of site inspection reports shall be submitted to the City of Whittlesea.

### 5.9 Heritage-listed infrastructure

Special consideration shall be given where proposed works have impacts on heritage-listed infrastructure (on the City of Whittlesea's Heritage Overlay, Victorian Heritage Inventory or Register) and such proposals shall be referred to a heritage advisor for comment.

Maintenance of infrastructure listed on the Heritage Overlay or State Inventory or Register may require specialist advice which should be considered during the design.

### 5.10 Construction supervision and certificates

It is the responsibility of the developer or principal to ensure that a suitably qualified engineer is engaged for supervising all structural works on site and providing a Certificate of Completion, which verifies that the structural components of the works were completed in accordance with the approved design plans (refer to section 5.5 above).

During construction, Council Officers shall be notified of all hold points unless confirmed otherwise by the City of Whittlesea as part of design approval.

At the finalisation of the construction works the following procedures shall be adhered to:

- A copy of all site inspection reports must be forwarded to the City of Whittlesea for its records.
- Prior to the City of Whittlesea's acceptance of Practical Completion (for the purpose of a Statement of Compliance), As Constructed plans shall be provided.
- The Defects Liability Period (DLP) that applies will be as for other engineering works or as required by the Planning Permit.
- The End of Defects Liability Period (EDLP) and Handover process followed will be as for other engineering works.
- Standard structural details (and/or shop drawings) shall be provided to the City of Whittlesea unless issued by the City of Whittlesea as a Standard Drawing.

# 6. Utility Infrastructure

Each new lot must be provided with a standard of utility services appropriate for its intended use. The required level of servicing for a subdivision needs to account for the proposed lot size and its use, local servicing capability, provisions of the Planning Scheme and any other relevant published policy.

- A services strategy must be provided.
- Street verges or nature strips must be of sufficient width to contain all of the anticipated services, including provision for street lighting, adequate space for large canopy street trees, footpaths and, where appropriate, car parking indents or other landscaping.
- Provision for utility services below or adjacent to water sensitive urban design swales and/or rain gardens must take into account requirements for minimum cover and utility access covers to properly match finished surface slopes.
- As per *EDCM's* Section 10.13, trunk and large feeder services should not be placed in access streets, access places or access lanes. However, where this is unavoidable and trunk or distribution services are required within road reserves, provision shall be made within a widened cross section to be clear of Council's infrastructure.
- Locating large pipes or conduits longitudinally beneath flexible pavements is not appropriate in growth area subdivisions and will only be considered as a solution of last resort for existing reservations having an inadequate nature strip width.
- Services (other than sewers) should not be located beneath footpaths. Where a sewer is under a footpath, backfill must be in accordance with construction specifications.

The key points that influence the provision of the various types of utility services infrastructure are summarised in the following sections.

### 6.1 Potable water supply

Subdivision for residential and industrial or commercial purposes can only occur in locations where there is access to an adequate reticulated water supply for domestic use and firefighting purposes. Rural subdivisions in the City of Whittlesea may have alternative requirements prescribed in the planning permit.

With respect to the provision of fire hydrants, the City of Whittlesea has made arrangements with the Country Fire Authority (CFA) under which the City of Whittlesea conducts the assessment and approval of hydrant locations (and firefighting access) together with the subsequent inspection of installation and marking. Where deemed appropriate, some subdivision plans may be referred by the City of Whittlesea to the CFA, in which case the CFA may remain the approval authority.

In all instances, water reticulation plans shall be submitted to the City of Whittlesea, as the coordinating authority, for their acceptance.

### 6.2 Recycled water supply

The City of Whittlesea supports the reticulation of Class A treated water for reuse and firefighting purposes. In areas where this option is available, provision of space for reticulation mains and distribution infrastructure shall be required.

The assessment, approval and inspection of plans by the City of Whittlesea is the same as for potable reticulation designs in the preceding clause.

### 6.3 Sewerage

Subdivision for residential and industrial or commercial purposes can only occur in locations where there is access to adequate sewerage reticulation and treatment facilities. Rural subdivisions in the City of Whittlesea where sewerage facilities are not available will have alternative requirements prescribed in the planning permit appropriate for the long-term, efficient and ecologically sustainable disposal of effluent on site.

Sewerage reticulation layouts shall be designed to minimise the number of maintenance access covers within footpaths and maintain prescribed clearances from other services.

In all instances, sewer reticulation plans shall be submitted to the City of Whittlesea, as the coordinating authority, for their acceptance.

Sewer manholes shall be located to avoid conflict with TGSi.

### 6.4 Gas

In accordance with the Victorian government's recent announcement, the City of Whittlesea does not support the reticulation of natural gas in new subdivisions from 1st January 2024.

### 6.5 Electricity

Underground reticulation of power cabling is a mandatory requirement in areas where development can be readily connected to the existing distribution system and the proposed reticulation is technically and economically acceptable to the service provider.

Public lighting in new subdivisions may be either standard facilities provided by the service provider, or by the installation of non-standard public lighting hardware which is the subject of an agreement between the City of Whittlesea and the service provider.

Non-standard public lighting shall be designed with regard to energy-efficient practices and technologies in accordance with Council's requirements below.

Lighting in Council reserves, including landscape feature lights, shall be designed and installed as a metered service. Obtrusive and upwards waste lighting should be minimised in accordance with AS/NZS 4282:2019 [Outdoor Lighting Obtrusive Effects](#) (SAI Global).

The existing overhead electricity lines must be undergrounded wherever practically possible with the consent of the service provider and responsible authorities. In this regard, any specific advice (guidelines and requirements) given in Precinct Structure Plans (PSP) or Development Plans (DP) must be followed.

## 6. UTILITY INFRASTRUCTURE

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### 6.5.1 Public lighting standards

The City of Whittlesea provides the following advice regarding the provision of public lighting for new development.

All developments must submit a master plan with a feasibility report showing how the development is proposed to be serviced with electricity in consultation with the service provider.

The locations of electrical substations (kiosks) must be planned at the earliest possible stage and identified on the Functional Layout Plans and civil drawings.

Lighting design shall be in accordance with the relevant Australian Standards, including the current issue of AS/NZS 1158 [Lighting for Roads and Public Spaces](#) (SLSC). All lighting must be LED.

Lighting installations for arterial roads and associated intersections are reviewed and approved by DTP as the responsible coordinating road authority. Copies of drawings shall be forwarded to the City of Whittlesea for assessment after which advice will be forwarded to DTP prior to approval.

Allowance for pole locations shall be provided within all road reserves and offsets are to be shown in 'service location tables' on FLPs and Road Construction Plans.

A minimum 800mm offset shall be provided from back of kerb to pole for all roads with P category lighting, including laneways and shared zones where kerbing is provided.

A minimum 1000mm clearance is required from face of pole to:

- Edge of carriageway in laneways, shared zones and extended driveways where no kerb is provided.
- Edge of pram crossings within nature strips.

With the exception of lighting in speed zones of 50km/h or less, frangible poles shall be adopted for roads with V category lighting in accordance with AS 1158 [Lighting for Roads and Public Places](#). The specific pole type (impact absorbing or slip base) shall be determined according to VicRoads standards and must be nominated on the drawings.

In addition, the offset for V category lighting on the outside of carriageways, including medians and mid-blocks, must be determined in accordance with VicRoads standards. In general, frangible poles shall not be located within:

- 1.5m of the road carriageway in speed zones greater than 60km/h and equal to or less than 80km/h.
- 3m of the road carriageway in speed zones greater than 80km/h. However, adjacent to a sealed shoulder that is 3m or more in width, the setback zone for frangible poles may be reduced to 1.5m from the road pavement.

'Easy fit' pole bases or foundations are required where maintenance access is restricted (such as laneways, paper roads and shared driveways).

Bollards are to be located where no kerb is provided; in laneways, for example.

### Non-standard public lighting

Any proposal to install non-standard public lighting in new subdivisions shall comply with the following standard requirements:

- Unless otherwise advised by Council Officers at the time of plan submission, LED lanterns (luminaires and lamps) acceptable to service providers and the responsible authority must be used for all P and V category lighting.
- Non-standard poles shall be galvanised Lincoln or Promenade poles. Black colour poles may be used, however, are considered non-standard poles.
- For the purpose of future reference and use, certain specific information must be incorporated into the lighting plans. The type and basic details of the accepted lighting poles, luminaires and brackets must be clearly shown on the public lighting plans; most importantly, standard or non-standard. Further, the plans must include details, including, but not limited to, manufacturer, model, colour, mounting heights, wattage and type, pole types, pole lengths and frangible poles.



- The City of Whittlesea is not the approval authority for public lighting plans. However, the City of Whittlesea will accept the plans after an assessment to ensure the City of Whittlesea's requirements have been incorporated in the design.
- A public lighting nomination form must be submitted along with the lighting plans reflecting all the required information as per the agreed lighting categories for different types of roads and other places, pole types, lantern types and others.

The developer shall contribute an upfront payment equal to the sum of:

- The current replacement cost, including supply and installation, of one non-standard pole for every 10 or part thereof, plus
- The current replacement cost, including supply and installation, of one non-standard lantern fitting for every 10 or part thereof, plus
- An amount of \$286.81 (being indexed to CPI from March 2020) for every non-standard pole installed.

The developer shall maintain hardware and lodge a refundable security bond for a period of time on each plan of subdivision as set out below:

Number of lots	Maintenance period	Bond
1-20	1 year	\$2,000
21-50	2 years	\$3,000
>51	3 years	\$4,000

**Table 5** Maintenance period and security bond amount based on the number of lots

For major estates comprising more than five stages, the above maintenance period(s) shall apply but the security required by the City of Whittlesea at any one time will be limited to \$15,000. 'Maintenance' includes the supply and replacement of damaged hardware irrespective of the cause.

### 6.5.2 Electricity construction drawing submission

Submissions for the installation of public lighting and electrical cabling shall include the following information as a minimum:

- An AusNet Services agreement form (such as 'Application for Installation of Non Standard Lighting'), signed by the applicant.
- All drawings, including those amended between initial submission and date of approval, shall have an individual, recognisable and permanent drawing number, revision and date.
- The drawing title shall include the Estate Name, Stage Number and Location of Estate (street name and suburb).
- A schedule of adopted lighting categories (can be added to the services offset tables).
- Spacing tables for each lighting type, each mounting type and each design category. The designer shall ensure that 'Lighting Technical Parameters', relevant to the lighting type used in the subject development, are applied in accordance with [AS/NZS 1158](#) (SLSC).
- Isolux contours to be shown on a plan where required or as requested by the City of Whittlesea.

### 6.5.3 Public lighting requirements for paper roads

- Paper roads shall be illuminated to PR5 category and meet all requirements as specified in AS/NZS 1158 [Lighting for Roads and Public Spaces](#) (SLSC).
- Public lighting for paper roads must be installed as part of civil works.
- Where possible, paper roads shall be illuminated via street lighting located within adjacent road reserves, negating the need to install additional lights along the length of the paper road. Public lighting shall not be installed within property splays.
- The paper road lighting shall be separately metered. The process related to the installation of paper road lighting is available [here](#).

## 6.6 Telecommunications (FTTP)

### 6.6.1 FTTP pit and conduit network

Refer to the [EDCM](#)'s Section 14.2 Fiber to the Premises (FTTP) Network.

# 7. Construction

The roles of developer, consultant or superintendent and contractor are distinct, as are the roles of the City of Whittlesea's development engineer, construction engineer and surveillance officer. All share a common interest in delivering engineering infrastructure for new estates.

## 7.1 Engineering construction framework

Construction specifications and standards shall be in accordance with the [EDCM](#)'s Part D. However, the guidelines for construction procedures to be followed in the City of Whittlesea take precedence over all documents listed in the [EDCM](#)'s Section 17.3 Order of Precedence, with the exception of the Acts of Parliament.

Preliminary specification clauses are based on Section 160 of the standard VicRoads specifications. It follows, therefore, that contractors and superintendents will require quality systems in place.

A third party accredited integrated management system (as provided by the Civil Contractors Federation), incorporating quality, safety and environmental aspects, is a minimum requirement for all principal contractors engaged for subdivision construction.

The requirements of the [Occupational Health and Safety Act 2004](#) and [Occupational Health and Safety Regulations 2017](#) (WorkSafe Victoria) must be adhered to in all construction activities related to development, including the supervision and execution of the works. For details refer to the [EDCM](#)'s Section 1.7.6 Occupational Health and Safety and Dial Before You Dig objectives in Section 1.7.13 Coordination of Street Works.

## 7.2 Construction procedures

### 7.2.1 Site management plans

The City of Whittlesea, in its role as the responsible authority, wishes to ensure that development occurs in an environmentally sustainable manner that is based upon sound documentation of the outcomes required during construction, prepared in advance and having due regard for all attributes of the site and its environs. Information and requirements accumulated during the investigation, planning and design phases need to be combined effectively with good construction practices in a manner which ensures knowledge transfer to the constructors.

This guideline is therefore applicable to the construction activities of all new development, whether by subdivision or buildings and works for which a planning permit containing conditions for a Site Management Plan (SMP) has been issued. Every stage of a development, including site establishment, works for other authorities, landscaping and maintenance activities, is to be the subject of SMP documentation.

The SMP must be site-specific and relevant to the issues applicable to a stage or subdivision or any works being undertaken as part of the development. It is to combine the following four items for the proposed works in a single document:

- Environmental Management
- Waste Management
- Traffic and Pedestrian Management
- Project Management (incorporating OH&S).

### 7.2.2 Construction Environmental Management Plan

A Construction Environmental Management Plan must be prepared in accordance with Section 18.1 Construction Environmental Management Plan (CEMP) of the [EDCM](#).

The City of Whittlesea requires the use of [Site Environmental Management Plan \(SEMP\)](#) (City of Whittlesea), which has been developed in conjunction with local government and the EPA.

## 7. CONSTRUCTION

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The CEMP must be submitted for endorsement with the Civil Engineering Plans to the Engineering Approvals Team, and must:

- Address occupational health and safety, traffic management, environmental controls and cultural heritage and/or dry stone wall protection measures to the satisfaction of the responsible authority.
- Be submitted to the responsible authority a minimum of 21 days before a required pre-commencement meeting (attended by authorised representatives of the construction contractor and project superintendent as appointed by the developer) on the site of the works.
- Include provision for a sign to be prominently displayed at the entrance to the estate affixed to the fence, gate or other appropriate location, detailing the name of the development and developer, name of civil consultant and name and address of contractor. The sign is to provide site emergency contact details including mobile telephone number and office telephone number (of a contractor site supervisor or similar) for any member of emergency services personnel or member of the public to contact in case of emergency or other significant event. This sign shall be erected prior to works commencing.
- Identify any site offices, workspaces, personnel rest and amenity areas, hardstands, material laydown areas and stockpiles.
- Include the proposed route for construction vehicle, equipment and machinery access to the site including a program for the upgrade and maintenance works required along this route while works are in progress.
- Address the location of parking areas for construction and sub-contractors' vehicles, equipment and machinery on and surrounding the site, to ensure that they cause minimum disruption to surrounding properties.
- Include measures to reduce the impact of noise, dust and other emissions created during the construction process.
- Demonstrate all environmental and cultural heritage and/or dry stone wall protection measures identified on a drawing(s) drawn to scale and prepared in accordance with Melbourne Water standards for such drawings.

- Provide measures to ensure that no mud, dirt, sand, soil, clay or stones are washed into or allowed to enter the storm water drainage system.
- Include means by which foreign material will be restricted from being deposited on public roads by vehicles, equipment and machinery associated with the building and works on the land to the satisfaction of the responsible authority.
- Address any recommendations of any approved Cultural Heritage, Dry Stone Wall and Conservation Management Plans applying to the land.
- Identify the location and method of any Tree Protection Zones.
- Ensure that all contractors working on the site must be inducted into an environmental management program for construction works.

All works must be carried out generally in accordance with the measures set out in the CEMP approved by the responsible authority. The developer must keep the responsible authority informed in writing of any changes to the CEMP. If, in the opinion of the responsible authority, the changes represent a significant departure from the approved CEMP, then an amended CEMP must be submitted to and approved by the responsible authority.

### 7.2.3 Waste management plan

It is documented that up to 30% of all waste in Australian landfills (by mass) is attributable to the construction and demolition of buildings. The City of Whittlesea wishes to encourage management processes that reduce the amount of construction waste going to landfill.

To this avail, all applications for new developments are requested to provide a Waste Management Plan that incorporates the following:

- A clear target for the proportion of site waste that will be recycled.
- A plan for providing accessible space for collecting waste in separated streams ready for recycling.
- Procedures for waste removal from site and details of the waste collection facilities to be utilised.
- Contractor instructions on waste management, to be included in the Site Induction.

### 7.2.4 Traffic management plan

A Traffic Management Plan (TMP) must be prepared in accordance with Section 18.2 of the [EDCM](#). The TMP must be reviewed and approved by the City of Whittlesea's Traffic and Transport Engineering Team prior to the pre-commencement meeting for construction works. The TMP must be submitted to [engineering.services@whittlesea.vic.gov.au](mailto:engineering.services@whittlesea.vic.gov.au).

Traffic Management Plans are required to demonstrate the safe ingress and egress of construction vehicles from the worksite, which may include a requirement by VicRoads for a road safety audit when main road access is involved. It should have due consideration for safety of the general public, other motorists and pedestrians whilst works are occurring, including periods of inactivity prior to completion. The plan must show safe management of pedestrian movements for the duration of the works.

Where works are conducted on a public road reserve all Traffic Management Plans are required to be prepared by a VicRoads accredited traffic management company to AS 1742 Standard [Traffic Control for Works on Roads](#). Any requirement for major traffic control devices or speed reductions will require an authorised Memorandum of Authorisation from the responsible road authority pursuant to the *Road Safety (Traffic Management) Regulations 2019*.

The plan must include the means by which foreign material will be restricted from being deposited on public roads by vehicles associated with construction activities (such as a wheel wash facility) and an identifiable response process to the occurrence of any hazard and/or nuisance arising from the failure of such restriction measures.

The plan must include Project or Estate name and Stage, commencement and completion date of the proposed works.

Depending on the proposed traffic route, a dilapidation report may be required by the City of Whittlesea.

### 7.2.5 Project Management Plan

The Project Management Plan is required to demonstrate the processes for achieving both product quality and OH&S objectives for the proposed works. It should address, but not be limited to, matters such as:

- Scope of work and details specific to the subject construction contract.
- Project objectives and targets covering quality and health and safety.
- Processes, including communication protocols, necessary for meeting the City of Whittlesea and/or client's requirements.
- Management roles, responsibilities and authorities.

### 7.2.6 Pre-commencement meeting

A pre-commencement meeting shall be arranged with the City of Whittlesea's Team Leader Construction Approvals as per Section 18.3 of the [EDCM](#). At its discretion, the City of Whittlesea may elect not to hold a pre-commencement meeting for minor stages subject to satisfactory submission of all pre-commencement documentation.

## 7.3 Earthworks

Refer to the [EDCM](#)'s Section 21.3.3.

### 7.3.1 Early earthworks

The City of Whittlesea may consider early earthworks application subject to the following:

- Functional Layout Plans are endorsed.
- Plan of Subdivision is certified.
- Civil Plans are well advanced (first set of comments on Detailed Design Submission).
- Prior to Commencement of Works Planning Permit conditions are met.
- All pre-commencement documentation (such as PMP, TMP, ITPs) is submitted and approved prior to any works commencing.

Boxing of pavement and construction of civil infrastructure will not be permitted under early earthworks application. Subject to Yarra Valley Water approval or consent, a sewer can be installed.

## 7. CONSTRUCTION

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### 7.4 Blasting and explosives

#### 7.4.1 Blasting

Blasting shall not be undertaken in the execution of work within the City of Whittlesea without the written agreement of the Manager of Urban Design and Transport department.

The Contractor shall comply with the [\*Mineral Resources \(Health and Safety\) Regulations 1991\*](#), all WorkCover Authority and Environmental Protection Agency requirements and the requirements of any other relevant authority and/or legislative regulation for the use of explosives and blasting on site.

**The Contractor shall use explosives only in circumstances where it is safe to do so, having due regard to the safety of persons, third parties and the safety of the works.**

No explosives shall be manufactured or charges loaded before 7am or after 3pm or on any day other than an ordinary working day and no charge shall be primed and no shot fired before 9am or after 3.30pm.

Firing shall not occur before the designated time for any single blast, nor more than 30 minutes after the designated time. The Contractor shall nominate set times, within those times detailed above, for firing of blasts. These times shall be made public via notice boards at relevant areas of the site and distribution of flyers at least seven (7) days prior to the planned blast date. The extent of the flyer distribution shall, as a minimum, correspond with the adopted Site Management Plan.

The Contractor shall give occupants of nearby premises and owners of underground services adequate notice of intended blasting. Prior to blasting the Contractor shall arrange with occupants and the owners of underground services any necessary protection of persons, property or livestock.

The Contractor shall notify the City of Whittlesea's Construction Surveillance Officer, third parties, statutory authorities and service owners that have an interest in, or are likely to be affected by blasting operations, of the general nature of the operation. The Contractor shall give a minimum of fourteen (14) days' notice to the City of Whittlesea's Construction Surveillance Officer and others described above of the proposed use of explosives. Within this notification, the Contractor shall submit a detailed method statement on all aspects of the proposed use of explosives, including treatment of misfires.

The Contractor shall provide the City of Whittlesea's Construction Surveillance Officer with the following information at least 48 hours in advance of any blasting:

- Details of the proposed location(s) and timing of all operations.
- The name of the person who will have control of the operation and proof of his or her licence.
- Documentary evidence of all necessary licences and permits from the relevant authorities.
- Documentary evidence of the currency of the Contractor's Public Liability Insurance policy.
- Precautions proposed to be taken for the protection of the public and property during the operation, including evidence that all affected parties have been notified.
- Full details of explosives, blasting patterns, blasting design details including ground vibration predictions, and any other relevant information.
- Method of monitoring blast vibration.

The shot firer shall keep a record of the number of shots fired, time of firing, type and weight of explosives used and the type and number of detonators used, together with a record of the post- blast situation for each and every location. A copy of the record shall be available for the City of Whittlesea's Construction Surveillance Officer.

A copy of vibration monitoring in accordance with the 'ground vibration' requirements detailed herein and for the corresponding period shall be made available for the City of Whittlesea's Construction Surveillance Officer to review at the end of every shift on which shots are fired.

The Contractor shall also establish and comply with air blast limits that ensure no damage occurs to any adjacent buildings.

### 7.4.2 Ground vibration

The Contractor shall employ construction methods that minimise ground vibrations near existing buildings, structures and underground services. Ground particle velocities shall be measured by the Contractor immediately adjacent to any building or underground service which might be damaged by vibrations. The Contractor shall bear all costs associated with any claim for damages resulting from the effects of ground vibration attributable to the Contractor's construction methods or work.

The City of Whittlesea may require that a dilapidation report be prepared where there is a likelihood of vibrations that may impact building or underground services.

The Contractor shall adopt construction methods to ensure no damage occurs to any adjacent buildings, services or structures. In all cases, the Contractor shall establish and maintain ground vibration limits that satisfy this requirement.

The limits established by the Contractor shall ensure no property damage occurs and shall not be greater than the levels suggested in AS 2187.2 [Explosives – Storage and Use – Use of Explosives](#) to avoid cosmetic damage to properties.

Vibration monitoring shall be conducted throughout the duration of relevant construction operations.

If vibration limits are exceeded, the Contractor shall immediately notify the the City of Whittlesea's Surveillance Officer and initiate an investigation to ascertain the cause of the exceedance. The Contractor shall provide an explanation of the exceedance and propose a course of action via a Non-Conformance Report to ensure that the exceedance is not repeated. Further work on the activity that resulted in the vibration limits being exceeded shall not proceed until the cause of the high vibration levels has been ascertained and the proposed course of action reviewed by the Manager of Urban Design and Transport.

# 8. Subdivision Works Compliance

In the City of Whittlesea, subdivision works compliance is a key step in ensuring that developers and their representatives meet all permit conditions and other relevant requirements. By adhering to these guidelines, the City of Whittlesea aims to ensure that development activities are carried out in a manner that meets the necessary standards and regulations, promoting sustainable and responsible growth within the city.



### 8.1 Engineering Practical Completion requirements

Requirements of the [EDCM](#)'s Section 9.4.1 Practical Completion of Engineering Works shall apply to subdivisions and other development where the construction of engineering works is a condition of the planning permit.

Prior to issue of Practical Completion, Council requires:

- [Completed Practical Completion Inspection Checklist](#) (City of Whittlesea).
- Completed Inspection and Test Plans.
- Certificates of Compliance for any structural works.
- Compaction test results for pavement courses.
- Level 1 Report for filling on allotments.
- As Constructed Plans as detailed in Section 8.1.1 following.
- Provision of any other documentation or information required which is essential for the use, operation and maintenance of the works.

#### 8.1.1 As Constructed Plans (engineering works)

The provision of As Built Data is a standard requirement for infrastructure created for subdivisions and includes the associated metadata required by Council for its Asset Management System. Provision of digital asset data under the A-Spec system has been adopted as the basis for this requirement.

The City of Whittlesea requires As Constructed Data from consultants or developers for newly built assets as per A-Spec standards to maintain Asset Registers.

Asset information must be projected to GDA94 in digital format to include D-Spec (drainage data), R-Spec (road data) and O-Spec (open space data) as per A-Spec standards.

Drainage shall be recorded in full (as per D-Spec) and other infrastructure is to be recorded to varying degrees of accuracy and extent according to type. For background see the [EDCM](#)'s Section 15.1.1 Recording of Asset Information.

Where a planning permit requires additional digital asset information, such as for WSUD and open space, this is mandatory and shall be provided in accordance with Council's A-Spec standard requirements.

Details required by Council as revisions to the approved engineering plans, including shop drawings for structural components, AusNet Services lighting plans and telecommunications plans, are to be submitted as follows:

- Any significant change in the location and/or alignment of the works that has occurred during construction.
- Sufficient levels to confirm the adequacy of overland drainage flow paths.
- Allotment levels adjacent to watercourses or floodways.
- Subgrade improvement measures, including depth, extent and materials.
- Capping layer details, including depth, material and permeability tests.
- Plan view (1:500 scale) prepared in Geocentric Datum of Australia Map Grid Australia (GDA94-MGA) Zone 55 projection.
- Drain location and alignment, as captured, to D-Spec standards.
- Easement for drainage and/or services that accurately reflect those provided on the sealed plan of subdivision.
- Electrical plan(s) amended to show final location and the distributor's ID number of each non-standard public lighting pole.
- The complete set of plans provided in digital current AutoCAD format (including dwg, Base and Xref files) and PDF format (via email).

The City of Whittlesea requires data in electronic format (A-spatial data) for Council's asset database as per A-Spec standards and as follows:

- Drainage (by line and pit)
  - Details, attributes and quantities, as captured, to D-Spec standards.
- Roads and road reserve assets
  - Streets (by name and limits if any change)
  - Road, roundabouts, footpath, kerb and other road reserve assets details, attributes and quantities, as captured, to R-Spec standards
  - Kerb and channel type (as per applicable VicRoads and Council's standards)
  - Footpath type (normally 'RC 125mm depth')
  - Road formation width (between backs of kerb)
  - Road pavement width and depth (including capping layer)
  - Road seal or wearing course width and type (W x 7mm type N asphalt, for example).

## 8. SUBDIVISION WORKS COMPLIANCE

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- Structures (by street location)
  - Details, attributes and quantities, as captured, to A-Spec standards
  - Type of structure (such as RC box culvert, steel pipe culvert, RC bridge, cantilever wall)
  - Length of the structure (measured along road centreline)
  - Width of the structure (measured across road)
  - Ancillary items forming part of main structure (such as retaining wall, RC drop structure).
- Non-standard public lighting (by pole location)
  - Details, attributes and quantities, as captured, to A-Spec standards
  - AusNet Services CAM/BID number
  - Pole type and size (commercial name and nominal height)
  - Mounting type and arm distance
  - Lantern type, rating and number per pole (commercial name and whether one or two on each pole).

Prior to Council's consent to Practical Completion, the following must be submitted to the satisfaction of the responsible authority:

- A complete set of As Constructed Plans of site works (amended, if necessary, to show any changes that may have occurred during construction), which include civil, electrical and telecommunication works, in digital file format AutoCAD (recent version) and PDF. The digital files must have a naming convention (Subdivision name\_Stage) to enable identification of Council assets listed and should be projected to GDA94-MGA Zone 55.
- A list of asset quantities which includes the following Council assets:
  - total length of roads, footpath, kerb and channel
  - total number of bridges, WSUD features and traffic calming devices
  - total length of pipe and number of pits for drainage and telecommunications
  - total number of streetlights
  - total number of road reserve assets.
- Asset information must include D-Spec (drainage data) and R-Spec (road data) as per A-Spec standards (the consultant/developer specifications for the delivery of digital data to local governments) in ESRI Shape Files (preferred format) or MapInfo with attributions.

All GIS and CAD data submitted must be in Map Grid Australia Zone 55 projection and referenced to Geocentric Datum of Australia (GDA) 1994.

Refer to the [website](#) for detailed A-Spec standards.

Bonds will not be released until such time as the drawings are delivered in the correct format to Council.

### 8.2 Defects liability

#### 8.2.1 Engineering works

Conditions applicable to Defects Liability Bond, Commencement of Defects Liability Period, End of Defects Liability Inspection and time for completion of defects can be found in the [EDCM](#)'s Sections 9.4.3, 4 and 5 and 23.5.6 respectively.

During the Defects Liability Period for subdivision roadwork, it is the practice of the City of Whittlesea to undertake the usual municipal maintenance of hard infrastructure and to conduct building control activities under local laws. The Final Inspection, undertaken by Council staff at the end of the Defects Liability Period, will therefore apply only to omissions and defects related to original construction of the works. Items to be rectified before Council accepts ongoing care and maintenance of the works will not include damage attributable to builders, road users or other activity by the public.

However, attention is drawn to the determination of the date for commencement of Defects Liability, which is "the date of issue to Council of the title(s) for roads created on the Plan of Subdivision... or on Practical Completion of (all) works... whichever is the later".

As stated previously in the document, Council will separate Practical Completion of WSUD elements if these works are to be deferred for the purpose of avoiding damage by construction of houses and other buildings. Conditions will be provided as part of the Uncompleted Works Bond arrangements.

The developer should therefore ensure arrangements are in place for control, protection and remediation of damage during the period leading up to the commencement of Defects Liability if this is not aligned with a contractor's responsibility.

### 8.3 Uncompleted Works Bond

Bonding of uncompleted engineering works to facilitate the issue of a Statement of Compliance is governed by the principles contained in the [EDCM](#)'s Section 9.4.2 Uncompleted Works Bond and this section.

Council's default position is not to support bonding of uncompleted works, however if circumstances warrant a reconsideration of this position a submission must be made to Council addressing the following items, in conjunction with [EDCM](#)'s Section 9.4.2, which Council will take into consideration when assessing whether bonding will be acceptable:

- There must be significant and justifiable reasons for the bonding of particular unfinished works.
- If an early release of titles will result in a poorly finished subdivision, has an adverse impact on public safety or a conflict of interest is likely for the developer (between contractual rights of a purchaser and the obligations of the roadwork contractor), then the works will not be bonded.
- Any legitimate request for bonding must be made in writing and be supported by a clear and achievable program, acceptable to the Council, for the completion of works.
- It must be shown that all roadwork will be completed prior to any builders, who may be contracted for house construction, become legally entitled to have access over those works.
- The developer and/or contractor have a demonstrable capacity and capability to complete the outstanding works within the proposed program.
- The method proposed by the developer to ensure that no builder activity can occur prior to Practical Completion of roadwork within the subdivision must be legally binding.

Under no circumstances will the Council consider bonding the following works:

- Road pavement courses (other than wearing course asphalt where weather precludes its installation).
- Kerb and channel.
- Engineering fill on lots.
- Stormwater drainage.

Council's requirements prior to the issuing of a Statement of Compliance for subdivisions that have not reached Practical Completion of all works is as follows:

- An unconditional bank guarantee, with no expiry date, shall be provided for an amount, agreed by Council, commensurate with the circumstances and/or risk to Council of the works not being completed satisfactorily. Conditions may vary but the amount of security required will be 150% of the cost to finish the works.
- The developer, or contractor on their behalf, is required to submit a construction program for the unfinished works with a nominated completion date.
- Evidence is provided by the developer confirming that no access over the uncompleted works, for house construction, can be legally obtained until Practical Completion has been accepted by Council.
- When Titles Office approval of the plan of subdivision is granted, the streets become part of the public road network and are subject to Council Local Laws. The developer shall notify its contractor(s) of this change to site conditions and ensure that work site signage and traffic control is implemented, to Council's satisfaction, for the changed circumstances. This may require the submission and approval of a new Site Management Plan.
- Achievement of Practical Completion to Council's satisfaction will require the works to be presented in a fully conforming condition, including the repair of any damage by third parties which may have occurred prior to the final Council inspection. Both the developer and contractor shall confirm that arrangements have been made between them to fulfil this requirement.
- There must be a clear understanding that when Council issues a Statement of Compliance involving bonding of unfinished works, the Defects Liability Period for the whole of the work will not commence until all parts of the required construction are completed to Council's satisfaction. Any Staged Practical Completion Certificate, for a part of the works unaffected by bonding, is a contractual matter for the Superintendent and not involving Council.

