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# CITY OF I PERTH

### **DESIGN & CONSTRUCTION NOTES**

## BOOK 100 STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES



REV	DATE	AMENDMENT
2.0	21/03/2024	REVISED & RE-ISSUED FOR USE

#### DISCLAIMER:

DESIGN & CONSTRUCTION NOTE INDEX STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES DRAWING NO 100.01 REVIEWED: 21.03.2024

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DESIGN & CONSTRUCTION NOTE ROAD RESERVE ALLOCATION

FOR UTILITY PROVIDERS STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

PROPERTY BOUNDARY LINE 2m 5m 1m 3m 4m 450/600mm Ο 600mm 750mm STORMWATER & NON-DRINKING WATER (MINOR ROADS ONLY) TRUNK SERVICES, COMMUNICATION TRUNK SERVICES COMMUNICATION POWER POLES, STREET LIGHTS & POWER DRINKING AND NON DRINKING WATER 1200mm POWER GAS PROPERTY BOUNDARY LINE 5m 4m 3m 2m 1m 450/600mm  $\circ$ 600mm 750mm TRUNK SERVICES, STORMWATER & SEWERAGE SEWERAGE, STORMWATER & NON DRINKING WATER COMMUNICATION POWER POLES, STREET LIGHTS & POWER DRINKING AND NON-DRINKING WATER 1200mm POWER GAS

### ROAD RESERVE ALLOCATION FOR UTILITY PROVIDERS

#### Pipe Colour for Underground Services

SERVICE	PIPE COLOUR
Gas	Yellow Pipe or Yellow Striped Pipe
Traffic Signals	Orange Pipe
Electrical	Orange Pipe, Orange Striped Pipe or Orange Electrical Tape for directly buried cable
Telecommunications	White Pipe
Water	Blue Pipe, Blue Striped Pipe or Black Pipe
Sewerage	Cream Pipe, Grey Pipe or Cream & Grey Striped Pipe

Colours of pipe relate only to PVC and polyethylene pipe and other materials could be used, particularly in older established areas unless otherwise stated. Some services may be buried directly in the ground and not in conduits.



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### ROAD RESERVE ALLOCATION FOR UTILITY PROVIDERS - GENERAL NOTES

- 1. Horizontal measurements relative to the Property Line on each side of the road reserve.
- 2. Although diagrams show a single utility conduit within each corridor, these may carry multiple cables of the same utility where applicable.
- 3. Junction pits and access chambers may extend into the 2.4-3.0 metre corridor by arrangement with the electricity network provider.
- 4. Use of the 4.2-5.0 metre corridor may be used by arrangement between utility providers.
- 5. Traffic light installation cables shall be located in the verge/footpath by arrangement with utility providers. Some variations may be necessary to standard utility alignments following negotiation and approval from other affected utility providers.
- 6. In new developments Power and Communications distribution cables are to be laid in locations shown. Under established footpaths some variations may be necessary following negotiation and approval from other affected utility providers.
- 7. In general, no underground utility service shall exceed a nominal 300mm diameter within the 0-3.0 metre corridor. Larger utility services may be located within this corridor following negotiation and approval of other utility providers.
- 8. Reticulation / Non-Potable, rising irrigation or non-drinking water mains location options indicated as non drinking water pipes in the diagram. Agreement must be obtained from relevant water utility prior to works commencing.
- 8. Cover, bedding and backfill are to be in accordance with utility provider's requirements and the requirements specified in *Book 1000.*
- 9. The planting of street trees should be of a type and variety to cause minimal interference to utility services.
- 10. Utility services may, in special circumstances, be located beneath the carriageway where verge space is insufficient. Consultation must be made and agreements obtained with all relevant utility providers and the City of Perth.
- 11. Refer *Utility Providers Code of Practice* for standard minimum clearances when undertaking works within the road reserve.
- 12. All reticulation to be laid within +/-100mm wherever practicable of the indicated centre line and secured against movement with initial backfill. Some utility practices may vary from this requirement particularly for multiple utility services.
- 13.Low voltage cables used for street lighting shall be installed in the 2.4-3.0 metre allocation. Cabling outside of the alignment shall be run at right angles to the corridor. Streetlight cabling in median strips shall be installed directly between poles but installation under road ways shall be avoided.
- 14. Where there are problems with the 0-0.5 metre alignment, power may be installed on the 2.4-3.0 metre alignment subject to approval by the power provider.
- 15. Services allocation in the 3.0-4.2 metre alignment shall be by agreement with nominated utility providers.
- 16. This Design and Construction Note has been prepared in reference to Utility Providers Code of Practice for WA (UPSC 2021).
- 17. Always dial: 1100 before you dig to check what services are located in the area you are working in.





### ROAD RESERVE ALLOCATION FOR UTILITY PROVIDERS IN NARROW ROADS



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FOR UTILITY PROVIDERS IN NARROW ROADS STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### ROAD RESERVE ALLOCATION FOR UTILITY PROVIDERS IN NARROW ROADS - GENERAL NOTES

- 1. The designers of narrow road reserves are obliged to consider the relationship of all utility services, surfaces and furniture with each other. The corridors shown in this diagram can only be varied with approval from all affected utility service providers.
- 2. All measurements generally relate to the distance from the property line on each side of the road reserve unless otherwise specified.
- 3. Access chambers may extend into the trees and lights corridor.
- 4. In general, no underground utility service shall exceed a nominal 300mm diameter within the 0-3.0 metre corridor. Larger utility services may be located within this corridor following negotiation and approval of other utility providers.
- 5. Reticulation & irrigation mains are to be located beyond the 3.0 metre alignment.
- 6. For narrow reserves with a wide road surface, the verge space available may be insufficient for trees while maintaining minimum clearances from other utility services.
- 7. Provision of an alignment for water distribution mains and other trunk services can be placed adjacent to the sewer, if the required space is available.
- 8. Cover, bedding and backfill are to be in accordance with utility provider's requirements and the requirements specified in *Book 1000.*
- 9. For stormwater and sewers:
- 9.1. Access chambers and maintenance shafts should be positioned in the sewer corridor. Alternatively they may need to be positioned in the road surface.
- 9.2. The minimum distance from the pipe to the property boundary shall be 1.0 metres.
- 9.3. Access chambers and maintenance shafts should be clear of the kerb.
- 9.4. The minimum cover to sewer shall be 0.9 metre.
- 10. All pits shall be totally contained within the utility service corridor except where approved by the utility service provider whose alignment is encroached upon. This may require staggering of pits.
- 11. Underground power cables may be installed on the 2.4-3.0 metre alignment, where there are installation and maintenance issues adjacent to retaining walls in the 0-0.5 metre corridor provided it is acceptable to other Utility Service Providers and doesn't interfere with street trees.
- 12. Service allocation in the 3.0-4.2 alignment shall be by agreement with nominated utility providers.
- 13. This Design and Construction Note has been prepared in reference to *Utility Providers Code of Practice for WA* (UPSC 2021).
- 14. Always dial: 1100 before you dig to check what services are located in the area you are working in.



### DESIGN & CONSTRUCTION NOTE STREET LAYOUT - TYPICAL CROSS-SECTIONS



STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES



#### General Notes

- 1. Carriageway/traffic lane cross-fall to be 2.5-3% to comply with AGRD part 3 & MRWA supplements.
- 2. Footpath cross-fall must comply with australian standard AS1428.1 & AGRD part 6a.
- 3. Traffic lane widths must comply to the standards set out in Austroads guide to road design.
- 4. \*Traffic lane widths may require to be larger along bus routes. consult with PTA for best practice.
- 5. For more detail regarding the footpath refer *design and construction note: book 300.*
- 6. Where an alfresco area is proposed access of 1.5m minimum must remain for pedestrians.



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### Cycle Plan 2029

This Design and Construction Note shall be read in conjunction with the City of Perth Cycle Plan 2029, which is available at the URL: https://engage.perth.wa.gov.au/cycling-in-the-city-of-perth

This Design and Construction Note outlines the desired infrastructure provided to cyclists along different strategic cycling routes. The different types of strategic cycle routes fall in to the following four classifications:

- Regional Routes
- City Cycle Routes
- Integrated Cycling Routes
- Pedestrian Priority Zones

The classification of a cycling route can be identified on the Strategic Cycle Network - Refer to the City of Perth Cycle Plan 2029 document.

### 1) General

For all dedicated cycle paths, shared paths, cycle lanes and integrated shared lanes, the regulatory signage required shall be provided as per MRWA Standards. Where practical, signage shall be placed on poles to avoid cluttering the surface of the path and combined to reduce the number of poles required.

The width of any dedicated cycle paths, shared paths, cycle lanes and integrated shared lanes, must comply with the latest Department of Transport Guidelines, Austroads Guidelines, Main Roads WA standards and commentary on Austroads guidelines and Australian Standards where applicable.

### 2) Regional Routes

Regional routes provide connections between major destinations in the wider metropolitan region and should be built to cater for high levels of cyclists.

The typical surface treatment for Regional Route cycle paths in the City of Perth is a black asphalt path with white line-marking that is separated from the vehicular traffic. Where an asphalt path is provided in a verge or planted area, the edges must be capped using a flush concrete beam.

### a) Separating Pedestrians and Cyclists:

Pedestrians and cyclists traveling together along regional routes should only be separated by providing a dedicated cycle path parallel to a pedestrian footpath, if there are high numbers of pedestrians and the width provided to pedestrians is considered generous.

### b) Intersections & Crossings:

Pedestrians and cyclists shall cross intersections using a shared crossing. The width of ramps provided shall be the same width as the path provided, with tactile indicators installed for the full width.

Where pedestrians and cyclists are crossing at a signalised intersection together, pedestrian lanterns are to be provided.



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### c) Custom Advisory Symbols:

City of Perth custom advisory symbols applied to the surface of the shared path shall be provided at the start and end of shared paths and also be provided at points of significance along the shared path such as vehicle crossings and areas of increased pedestrian activity. Example of commonly used advisory symbols:



### d) Slow Points (Chicane):

If unavoidable a slow point for cyclists can be provided on regional routes, where they are approaching a hazard, by creating a chicane using two barriers. The barriers shall be installed to create a sharp double bend to slow cyclists. Where practical a signage panel shall be attached to the barriers warning cyclists of the upcoming hazard.

For more detail regarding the chicane and installation refer *Design and Construction Note: Book* 500.

### e) Service Pits and Drainage:

To minimise the impact on the surface of the shared path, service pits that are placed within an asphalt shared path shall have infill lids. Infill material is to be black asphalt to match the surface.

The shared path should be designed so that runoff from rain falls towards a road or verge. If this is not practical drainage structures can be installed. The preferable drainage solution for shared paths is a trench drain that runs along the lower side of the shared path. Where an open drainage gully pit is required, it must be installed with a cycle friendly grate.

### 3) City Cycle Routes

City Cycle routes will be typified by dedicated cycle lanes in a number of forms and will connect regional routes and major destinations.

The typical treatment for City Cycle Routes in the City of Perth is on-street cycle lanes with black asphalt and white line-marking. Cycle lanes shall be placed along the kerb and where on-street parking is provided a 500mm buffer between parking and cycle lanes shall be provided.

### a) Intersections & Crossings:

At signalised intersections cycle lanes shall have cycle detection loops, cycle symbols, cycle head-start boxes and cycle lanterns. Cycle head-start boxes provide cyclists with a queuing area and cycle lanterns provide priority to cyclists to allow cyclists to proceed through the intersection prior to vehicular traffic. The size and layout of loops, symbols and head-start boxes must comply with the MRWA standards.



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Where cyclists cannot cross a signalised intersection with vehicular traffic safely, there may be instances where cyclists transition to footpath level and merge with pedestrians. These areas are considered Pedestrian Priority Zones. In these situations, pedestrians and cyclists shall cross intersections using a shared crossing with lanterns provided.

At conflict areas such as intersections and driveways with high traffic, green surface treatment shall be applied to the cycle lanes. Typical use of the green surface treatment is listed below:

- Green surface treatment shall be provided for all cycle head-start boxes.
- 20m of green surface treatment shall be provided where a cycle lane approaches a signalised intersection.
- Green surface treatment shall be provided for the length of cycle lanes crossing unsignalised intersections.

At high conflict areas which required additional protection, raised cycle lane separators such as 'armadillos' can be installed between the cycle lane and vehicular traffic lane. These raised cycle lane separators provide extra protection from vehicles encroaching the cycle lane however cannot be used where vehicles are permitted to cross the cycle lane.

#### b) Drainage Pits:

Where an open drainage gully pit is required within the cycle lane, it must be installed with a cycle friendly grate. All new gully pits shall be supplied with a cycle friendly grate and all existing gully pits shall be retrofitted.

### 4) Integrated Cycling Routes

Integrated Cycling routes are characterised by slow-speed bicycle friendly routes that provide fine grain or direct connectivity to destinations in the urban environment.

The typical treatment for Integrated Cycling Routes in the City of Perth is wide on-street lanes to be used by both cyclists and vehicles, in areas with speeds no greater than 40km/h. Lanes to be provided shall be wider than standard traffic lanes and be black asphalt with white line-marking.

### a) Intersections & Crossings:

At unsignalised intersections cyclists are to proceed through the intersection as a member of the general traffic.

At signalised intersections, if sufficient space is available cycle lanes shall be provided for 20m approaching the intersection, with cycle detection loops, cycle symbols, cycle head-start boxes, cycle lanterns and green surface treatment as per the intersection detail for City Cycle Routes.

### b) Signage:

A blue 'Share the Road' sign (manufactured and installed by MRWA) and a white paint cycle symbol (placed centrally in the lane) shall be placed at the beginning of Integrated Cycle Routes and after signalised intersections. All regulatory signage required shall be provided as per MRWA Standards.



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### 5) Pedestrian Priority Zones

Pedestrian Priority Zones are areas with concentrated cultural, social and recreational uses where vehicle access is significantly restricted. The zones are predominantly pedestrian spaces that can accommodate slow-speed cycling. Pedestrian Priority Zones may also refer to the footpaths at signalised intersections which cyclists are permitted to utilise but where pedestrians still remain the priority consideration for design.

The surface treatment for these areas will typically be block paved, the detail of which may vary depending on the location.

### a) Signage:

Advisory signage for cyclists in these areas may use typical 'sign on pole' arrangements and Custom Advisory Symbols applied to the pavement surface. The Custom Advisory Symbols, similar to those used for regional routes, may be applied at the start and end of Pedestrian Priority Zones and at points of significance which may identify hazards and potentially aid way-finding. Examples of commonly used advisory symbols are shown in this document, refer 2c - Regional Routes, Custom Advisory Symbols.

### b) Slow Points (Chicane):

Not preferable within high volume pedestrian areas however a slow point for cyclists can be provided on Pedestrian Priority Zones, where they are approaching a hazard, by creating a chicane using two barriers. The barriers shall be installed to create a sharp double bend to slow cyclists. Where practical a signage panel shall be attached to the barriers warning cyclists of the upcoming hazard.

For more detail regarding the chicane and installation refer *Design and Construction Note: Book* 500.



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DESIGN & CONSTRUCTION NOTE ON-STREET PARKING BAY DIMENSIONS

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES



#### ON-STREET PARKING BAY WIDTH (X)

SPACE USAGE	WIDTH
CARS & LIGHT COMMERCIAL VEHICLES ( minor streets )	2.1m
CARS & LIGHT COMMERCIAL VEHICLES ( all other streets )	2.3m
TRUCKS & BUSES	2.6m

#### ON-STREET PARKING BAY LENGTH (Y,Z,W)

ID	DESCRIPTION	MIN	DESIRED
Y	ENTRANCE TO BAY IS NOT OBSTRUCTED	5.4m	6.5m
Z	INTERMEDIATE BAYS	6.0m	6.7m
W	END OF BAY IS OBSTRUCTED, SUCH AS A 'NIB'	6.3m	6.7m
Y,W	LOADING ZONE	9m	10m
Y,W	BUS / COACH STAND	14m	15m



DRAWING NO

General Notes

 This design and construction note has been prepared in reference to:

> AS/NZS 2890.5:2020 parking facilities part 5: On-Street Parking (Speed limit 50km/h).

- 2. It is preferable for loading zones and bus bay entrances and exits to be splayed. Refer design and construction note 102.01.
- For more detail regarding the interface between the on-street parking and the footpath refer design and construction note: BOOK 300.
- Disabled bays are to be provided at the footpath level. the size and pavement required are detailed in design and construction notes: 102.03 & 102.04.
- Where parking is angled at 90° adjacent to footpaths, cycle or shared paths parking stops must be installed in the bays to prevent vehicles from overrunning onto paths.
- 6. For wheel stop details refer to AS 2890.1



### DESIGN & CONSTRUCTION NOTE PARKING EMBAYMENT WITH SPLAYED NIBS

PARKING BAYS





R1.3M KERB 45° SPLAY





General Notes:

- Max / Min lengths for concave / convex kerbs vary for details refer Design and Construction Notes: Book 400.
- Generally embayment design for coaches, buses, loading zones and taxis will have splayed nibs using barrier kerbs. While it is acceptable for loading zones and taxi embayments to have a 45° splay, bus and coach embayments require a 30° splay.
- Major street enhancement projects may utilise a combination of splays for car parking.
- 3. The minimum lengths and widths of parking bays are considered in *Design* and *Construction Note* 102.00
- 4. The paving material for parking embayments at road level shall be asphalt. The detail of asphalt is to be the same as the road, refer *Design and Construction Notes: 104.00*



### DESIGN & CONSTRUCTION NOTE ON-STREET MOTORCYCLE BAY DIMENSIONS

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### DRAWING NO 102.02 REVIEWED: 21.03.2024



PREFERRED OPTION: 60° ANGLED BAYS. BAYS SHOULD BE ALIGNED WITH THE DIRECTION OF TRAFFIC FLOW. (Motorcycles reverse into bays and exit in forward motion.)



USE OF IRREGULAR SPACES AND UNDERSIZE REMNANTS SHOULD ALSO BE CONSIDERED FOR MOTORCYCLE PARKING



WHERE STREET TREES ARE SITUATED ON EXTENDED FOOTPATHS BETWEEN EMBAYMENTS, IT IS PREFERABLE FOR THE MOTORCYCLE BAY TO BE PLACED BETWEEN THE CAR BAY AND THE 'NIB'.



IN ANGLED PARKING ZONES, ONLY CAR SPACES AT THE ENDS CAN BE CONVERTED, AND THEN ONLY IF ROADWAY CROSSFALL IS NOT TOO STEEP.



### General Notes

- Motorcycle parking zones are provided in most streetscapes.
- 2. Use of irregular spaces and undersize kerbside remnants are usually used for motorcycles. however when there is a greater demand, motorcycle bays may be grouped together, in place of a car embayment.
- In situations where street trees are situated on extended footpaths between embayments, it is preferable for the motorcycle bay to be placed between the car bay and the 'nib'.
- 4. In accordance with AS2890.5:2020, the minimum size for a motorcycle parking space is 2.5m x 1.2m.
- 5. In narrow streets where parking embayments are less than 2.5m wide, angled motorcycle bays would be the preferred option.
- 6. Motorcycle parking is to be located in front of car bays.





NON-STANDARD OPTION SUITABLE IN NARROW STREETS



PARKING SPACE IS: 2.5m x 1.2m MINIMUM 2.5m x 1.5m DESIRED



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### DESIGN & CONSTRUCTION NOTE LINE MARKED ACROD PARKING BAYS

PARKING BAYS







General Notes:

- The slope of the dedicated parking space & adjacent shared area to not exceed 1:33 for a bitumen surface or 1:40 for every other surface.
- 2. Head room over the dedicated parking space & adjacent shared area to be no less than 2500mm.
- Mark the dedicated space with the white symbol of access (AS1428.1) on a blue rectangle, 800-1000mm high, with no side more than 1200mm placed as a pavement marking in the centre of the space between 500-600mm.
- 4. Pavement marking to be yellow & have a slip resistant surface. Refer to AS2890.6 clause 3.2 for details.
- Flush kerbing only between the dedicated space & adjacent shared area and at the rear of the dedicated space & shared area.
- 6. Attached style of kerb ramp is not acceptable.
- The slope of the footpath at the head of the bay is to be no steeper than 1:40
- 8. Bollard to be 1300mm high, yellow with red warning strips.



### DESIGN & CONSTRUCTION NOTE ACROD AND UNIVERSAL BAYS

PARKING BAYS

### DRAWING NO 102.04 REVIEWED: 21.03.2024







General Notes:

- Accessible Parking space shall be identified by means of a white symbol of access in accordance with AS 1428.1 between 800 mm and 1000 mm high placed on a blue rectangle with no side more than 1200 mm, placed as a pavement marking in the centre of the space between 500 mm and 600 mm from its entry point as illustrated.
- 2. Accessible parking bays should provided on footpaths where:
- 2.1. A need for such a bay has been identified in consultation with parking services; and
  2.2. The footpath can maintain a
  - The footpath can maintain a 1600mm minimum clearway in addition to the accessible parking bay.
- Please note that this detail is based on a kerb height of 130mm. In instances where the kerb height differs, keep front of kerb flush with road surface level and take up variance within the embayment and footpath.
- Dedicated parking spaces shall be outlined with unbroken lines 80mm to 100mm wide on all sides excepting any side delineated by a kerb, barrier or wall.
- 5. Line marking must be yellow and non-slip.



### DESIGN & CONSTRUCTION NOTE STANDARD PARKING SIGN AND POLE

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### DRAWING NO 103.000 REVIEWED: 21.03.2024





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### **DESIGN & CONSTRUCTION NOTE** STANDARD PARKING SIGN AND POLE

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES



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### DESIGN & CONSTRUCTION NOTE ON-STREET PARKING TICKET MACHINE

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### DRAWING NO 103.02 REVIEWED: 21.03.2024

#### Installation and orientation:

Ticket machines must be installed in accordance with manufacturer's specifications. the supplied mounting frames should be set into concrete to obtain a structurally safe footing. a minimum of 25mpa fast curing concrete with no reinforcement is preferred. see attachments for foundation details.

Depending on the required shape of the foundation, the concrete mass dimensions should follow the manufacture's specifications.

Experienced professional staff shall carry out the concrete foundation works.

CPP technical services staff to mark location and orientation of the on street ticket machine in accordance with the agreed placement strategy.

CPP technical services assign the machine id and position on all info to assett management & map info.

Orientation of the ticket machines should follow the following principles:

- is placed on a footpath or walkway, the ticket machine must be placed with a minimum of 600mm from the kerbing edge.
- must not be placed close to trees, street lights poles, street furniture and other obstructions.
- ticket machine should be placed with machine front facing on coming traffic. the footpath or walkway if the footpath width is more than 2 meter wide.
- should have the most favourable exposure to the average all season sun orientation for optimal performance of the solar panel.
- should not be placed near garden beds where exposure to reticulation overspray is expected.

Ticket machine to be equipped with a two sided white on blue 'ticket' pole sign. ticket signage to face pedestrian traffic directions on both sides.





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### DESIGN & CONSTRUCTION NOTE ON-STREET PARKING TICKET MACHINE

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

#### 1. Installations

All of the installation varieties are approved, but case 1 is preferred, as being the cheapest and most time effective.

	Footing Type	Anchor Type
Case 1 (Preferred)	600mm diam x 600 deep unreinforced cocnrete pad footing	Hilti HIT-HY 150 M16 Epoxy sleeve anchor - Stainless steel
Case 2	600mm diam x 600 deep unreinforced cocnrete pad footing	830-0000-0169 Mounting frame PND
Case 3	600mm diam x 600 deep unreinforced cocnrete pad footing	Hilti HIT-HY 150 M16 Epoxy sleeve anchor - Stainless steel
Case 4	600mm diam x 600 deep unreinforced cocnrete pad footing	830-0000-0169 Mounting frame PND
Case 5 (See section 5)	1.2m x 1.2m 75mm thick pavement slab (existing pavement)	Hilti HIT-HY 150 M16 Epoxy sleeve anchor - Stainless steel

Materials:

- · Concrete; minimum 25mpa unreinforced, fast curing (1-2 hours) preferred.
- 830-0000-0169 mounting frame pnd:
- HILTI HIT-HY 150 M16 (5.8" X 6") epoxy sleeve anchor stainless steel



#### 1. Preparation

Mark and cut the desired shape in the pavement, at the location of the meter. (Round diam 600mm or square 600mm x 600mm); It is not advised to cut any closer than 100mm from the kerb. The depth of the hole for the concrete should be 600mm. 600





In rare cases, where circumstance does not allow a depth of 400mm (e.g. because of drains or cables), depth can be reduced to 400mm, providing the widths are increased to 800mm)





### DESIGN & CONSTRUCTION NOTE STANDARD ROAD PAVEMENT SECTIONS

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES







### FLEXIBLE PAVEMENT WITH ASPHALT

### **General Notes**

The preferred treatment for roads within the municipal boundaries of the City of Perth is a flexible asphalt road pavement.



### ROAD PAVEMENT DESIGN SPECIFICATION

### 1) General

- a) Road asphalt shall be designed in accordance with MRWA Engineering Note.9 and meet the minimum design life as specified.
- b) Road pavements shall be designed in accordance with MRWA Engineering Note.9 and meet the minimum design life as specified.
- c) Design of the pavement shall involve consideration of the following five inputs:
  - i) Design Traffic Loading
  - ii) Sub-Grade Evaluation
  - iii) Environmental Impact
  - iv) Pavement and Surfacing Material
  - v) Construction and Maintenance
- d) Road pavement design shall be carried out by a qualified engineer with appropriate knowledge of pavement design in the local environment.
- e) The pavement design, including all considerations, assumptions, sub-grade test results, calculations, detailed drawings and any other relevant documentation shall be submitted to the City of Perth for endorsement prior to the commencement of construction and/or procurement of materials. Drawings provided shall clearly indicate the structure, material types and thickness of each layer of the proposed pavement and surfacing. Any variation to these requirements may be accepted by the City of Perth in special circumstances.
- f) Rigid pavement design may be considered in special circumstances, through consultation with the City of Perth.

2) Surface, Base Material, Subgrade & Earthworks

For specification of the road surface and base material refer:

- MRWA Specification 501 Earthworks
- MRWA Specification 302 Earthworks



DRAWING NO 104.02 REVIEWED: 21.03.2024

STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### **REFERENCED DOCUMENTS**

(ASCE 2013)	ASCE Policy Statement 418
(Austroads 2016)	Guide to Pavement Technology Part 2: Pavement Structural Design
(DGLWA 2011)	Asset Management - Framework and Guidelines
(IPWEA NSW 2010)	Recycled Materials in Road Pavements Specification
(IPWEA WA 2002)	Restoration and Reinstatement Specification
(MRWA 2013)	Engineering Road Note 9 - Procedure for the Design of Flexible
	Pavements
(MRWA 2018)	MRWA Specification 201 - Quality Systems
(MRWA 2013)	MRWA Specification 302 - Earthworks
(MRWA 2018)	MRWA Specification 501 - Pavements
(MRWA 2017)	MRWA Specification 503 - Bituminous Surfacing
(MRWA 2017)	MRWA Specification 504 - Asphalt Wearing Course
(MRWA 2017)	MRWA Specification 508 - Cold Planing
(MRWA 2015)	MRWA Specification 510 - Asphalt Intermediate Course

### **REFERENCED AUSTRALIAN STANDARDS**

AS 1289:2014	Methods of testing soils for engineering purposes
	Note: Multiple parts available, refer all appropriate parts.
AS 2008-2013	Bitumen for Pavements
AS 2150-2005	Hot mix asphalt - A guide to good practice
AS 3798-2007	Guidelines on earthworks for commercial and residential developments



### ROAD SURFACE MATERIAL SPECIFICATION

### 1) General

- a) Road surface shall be designed for a minimum of 25 years design life in accordance with MRWA Engineering Note 9.
- b) Class C320 bitumen binder with 75 blow Marshall properties shall be used and shall comply with *AS2008-1997 & Specification 504.*
- c) Asphalt shall be laid in accordance with *AS2150-2005 & Specification 504.* Asphalt shall not be laid if rain is imminent or if the temperature of the surface taking asphalt is less than 15°C for wind speed < 20km/hr; 20°C for wind speed > 20km/hr.

### 2) Tolerances

- a) Values for testing of road surface tolerances shall be MRWA Specification 504.
- 3) Testing
  - a) All testing shall be conducted in accordance with the relevant Australian Standard and/or Main Roads WA Specifications *MRWA 503, MRWA 504 & MRWA 210*, by a NATA qualified independent testing authority.
- 4) Non-Conforming Road Surface
  - a) If the road surface does not conform to any of the specified requirements, the road surface shall be profiled and resurfaced with fresh asphalt. Resurfacing shall have a minimum transverse width of the trafficable lane and a minimum longitudinal length of 20m. The corrected pavement will be subjected to re-testing to ensure it conforms with all of the specified requirements. The City will bear no cost for any correction done for non-conforming surfaces.



FOR PAVEMENT, EARTHWORKS AND DRAINAGE STREET LAYOUT AND PAVEMENT DESIGN GUIDELINES

### DRAWING NO 104.04 REVIEWED: 21.03.2024

### RECYCLED MATERIAL FOR PAVEMENTS, EARTHWORKS AND DRAINAGE

"The City of Perth achieves environmental improvement while supporting its social and economic need through equity and integration. Environmental impacts will be prevented, minimised and managed in city activities while creating and maintaining a resilient, diverse and attractive environment. The Perth environment will evoke pride, connection and a sense of place with its community."

City of Perth - CP 8.0 Environment Policy

The City of Perth supports the increased recovery and use of recycled materials to minimise our environmental impact by reducing the consumption of natural resources. This will minimise our contribution of extracting unsustainable quantities of natural resources and provide sustainable solutions to protect the availability of these resources for future generations.

1) Selecting Recycled Materials

- a) The selection of recycled materials shall be in accordance with *"Recycled Materials in Road Pavements Specifiction"* (IPWEA NSW 2010).
- b) Each material class (Base, Sub-Base etc.) must conform to the properties outlined in IPWEA specification for recycled materials.
- c) The supplier must provide certification of material testing by a NATA qualified independent testing authority in accordance with *AS1289:2014*.
- d) Stabilised road base material can be used for road construction, but the specification for these materials shall be lodged to the City prior to proceeding with the pavement design.

2) Compaction and Placement of Recycled Materials

e) When using recycled materials, appropriate method of compaction and placing technique shall be employed to avoid the possible breakdown of weakened constituents during construction.

