



City of
Wanneroo

& W.A. AUS-SPEC #1

**GUIDELINES FOR DEVELOPMENT AND
SUBDIVISION OF LAND**

**Development Design
Specifications**

DESIGN

Issue No 4.0 June 2019

19/235334[v2]

CITY OF WANNEROO & W.A. AUS-SPEC #1

GUIDELINES FOR DEVELOPMENT & SUBDIVISION OF LAND

DEVELOPMENT DESIGN SPECIFICATIONS

DESIGN SERIES

Version 1.0	- July 2001	(AUS-SPEC #1 Revisions & Updates, March 2001)
Version 2.0	- March 2003	(AUS-SPEC #1 Revisions & Updates, March 2001)
Version 2.01	- May 2014	(Minor amendment to WD11: Vehicular Crossover Design)
Version 3.0	- April 2015	(Changes to WD5 Stormwater Drainage Design, April 2015)
Version 4.0	- June 2019	(Changes to WD5 Stormwater Drainage Design, 15/557866[v3])

The City of Wanneroo's Guidelines for Development & Subdivision of Land adopting IMEA Western Australia's version of the Aus-Spec#1 Design Guidelines as the foundation document. The guidelines also includes traditional standards specifically used within the City of Wanneroo. The City encourages designers to consult and liaise with Council officers as early as possible in the design process. This enables the ground rules to be set and the early resolution of any issues that may arise.

The City has sought to provide subdividers with a comprehensive set of specifications for the development of land that will :

- Be based on recognised industry design standards and technical guidelines
- Provide uniformity across the Western Australian land development industry and
- Allow flexibility for designers to incorporate unique features into their subdivisional layouts.

Designers and developers need to be aware that the community has an ongoing interest and commitment to the economic maintenance of infrastructure provided by developers. As such, the City, being the management authority for the infrastructure needs to be completely satisfied with the long term performance of the subdivisional design presented to it for approval.

Important Note :

Given the complexity and the comprehensive nature of information provided in the Guideline, and the cross referencing to other documents, standards and policies it is likely that amendments will occur from time to time. The City encourages innovation and improvement in all aspect of the development process and it is hoped that future adjustments to the Guideline reflect such.

Please report all errors and/or direct queries in relation to the standards to :-

Manager Strategic Asset Management

City of Wanneroo

23, Dundobar Road WANNEROO WA 6065

Postal Address : Locked Bag 1, WANNEROO WA 6946

Or email to : enquiries@wanneroo.wa.gov.au

*Please direct all relevant e-mails to the attention of **The Manager Strategic Asset Management***

(Please note that all requests for standards reviews must be accompanied by full justifications and documentation in support of the request)

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2019 Version 4.0 – June 2019 (Interim Amendment to WD5: Stormwater Drainage Design)

This revision further considers the application of water sensitive urban design (WSUD) as it applies to the City of Wanneroo. It requires designers to consider its impact on the City and to use WSUD elements that are suited to local conditions.

Changes in this issue:WD5.01 – Scope

- WD5.01 (2) :- Clause modified adding things to consider with the use of WSUD at the City of Wanneroo.
- WD5.01a :- new glossary terms added
 - (12) GPT
 - (13) Hydraulic Conductivity
 - (14) Infiltration

WD5.02 – Stormwater Management Objectives and Criteria

- (1 - 5) :- New clauses added to consider the use of WSUD at the City of Wanneroo.
- (6) :- Additional text added for Predevelopment v post development requirement.
- (7) :- Clause reworded with respect to small, minor and major rainfall events.
- (8.1d) :- Deleted 'a maximum side slope for swale is 1:3 and no deeper than 0.5m'.
- (8.1d) :- Deleted 'infiltration trenches' replaced with infiltration cells.
- (8.1d) :- Deleted 'soakwells and porous base catchpits'.
- (8.1d) :- Deleted 'pervious paving'.
- (8.1e) :- Clause added requiring designers to consider the impacts with the use of detention/retention WSUD structures in residential verges.
- (8.2b & 8.3b) :- Text added to clause, "Flow rates are to be managed to prevent erosion."

WD5.05 – Catchment Area – Clauses deleted and renumbered

- (1) :- Clause modified deleted '*The total catchment area shall include all public land such as road reserves, public car parks, public buildings etc. Stormwater drainage from commercial properties in suburban areas is to be incorporated in the drainage system*'.
- (3) :- Clause deleted '*All stormwater runoff from constructed impervious surfaces within a private property lot should be included as the catchment for the lot (note roof catchment is managed via the Building Code of Australia)*'.

WD5.09 – Minor System Criteria

- (1) :- Reference to IPWEA Guidelines clause number updated.

WD5.10 – Pits – Clauses deleted and renumbered

- (2) :- Text deleted from Clause, '*Preference will be given to the location of side entry pits at a point approximately 8 metres from the side boundary or centrally located between lot boundaries (allowing for future crossovers)*'.
- (2) :- Text added to clause, '. The use of grated gully pit may be considered if appropriate.'
- (3) :- Clause deleted, '*For lots having a frontage of less than 18m, grated gully pits should be used so as not to restrict crossover access*'.
- (7) :- Infiltration Pits – Clause modified to address requirements associated with the use of infiltration pits.

WD5.13 – Open Channels

- (1) :- Maximum side slopes on grassed lined, unfenced open channels - preference to 1 in 8 instead of 1 in 6.

WD5.22a – Water Quality

- (c) :- Clause modified.
- (e) :- maximum depth below top water level modified to 300mm instead of 500mm.
- (f) :- treatment area side slopes not to exceed 1:4 instead of 1:3.

WD5.22b – Infiltration – Clauses deleted and renumbered

- (4) :- Clause deleted, '*The deep water table approach is suitable where the water table is greater than 4.0 metres below the ground surface. Use of PCSUMP (deep water table option) or the spreadsheet model INFIL is recommended*'.
- (5) :- Clause deleted, '*The shallow water table approach is suitable where the water table is within 4.0 metres of the ground surface. Use of PCSUMP (shallow water table option) or MODRET is recommended*'.

WD5.24 – Public Open Space Storage Areas

- (1) :- Clause modified, 'The City will not accept small rainfall event runoff into a POS' deleted and changed to, 'Rainfall events to be discharged into a POS must be conveyed through a GPT'.
- (2) :- Previous Clause deleted, 'Areas containing drainage infrastructure (such as pipe discharge outlets and energy dissipation structures) and areas where surface flows are such that the product of depth multiplied by velocity exceeds 0.4m²/sec shall be treated as restricted Public Open Space (POS) for purposes of POS liability. Restricted POS is limited to a maximum of 2.0% of the gross sub divisible area (Liveable Neighbourhoods)'.
- (2a) :- Side slopes below TWL are no steeper than 1:8 instead of 1:6.
- (2d) :- Clause added, 'In extenuating circumstances, such as minimising impacts on environmentally sensitive areas and the retention of natural areas, the City may consider water depths greater than 1.2m below the TWL. A full risk assessment will need to be undertaken and weighing out the risks associated with the increased depths of inundation'.
- (6) :- New clause added.

WD5.25 – Fenced Sumps as Storage Areas

- Clause deleted to discourage use of fenced sumps and explanation added, 'The use of fenced sumps as flood storage areas are unlikely to be supported. The City considers that urban stormwater management systems should be designed to achieve good urban amenity and provide multiple functions maximising the efficient use of land. Early discussion with the City must be undertaken prior to considering this option'.

General textural changes

The reference to '**flood storage receiving environments**' has been changed to '**flood storage areas**'.

2015 Version 3.0 - April 2015 (Amendment to WD5: Stormwater Drainage Design)

This revision is to enhance the specification so that it supports water sensitive urban design to encourage better outcomes for the City of Wanneroo. It is envisaged that this revision will improve the integration of nature, recreation and sport amenities with drainage retention/detention requirements in POS.

The following are changes to the City Guidelines document and only pertain to WD5: Stormwater Drainage Design :

- Section numbering has been amended to accommodate the preference of POS as the receiving environment for flood storage rather than fenced sumps.
- WD5.01 includes the section on alternative design for flood storage receiving environments and a Glossary of terms
- WD5.02 has been re-worded and expanded to define small, minor and major rainfall events.
- WD5.03 Council policies have been added.
- WD5.04 a table has been added for the Annual Exceedance Probability.
- WD5.05 Private property catchment added
- WD5.06 Small lots defined as < 300sqm
- WD5.09 Included reference to grated gully pits in low points
- WD5.10 Added grated gully pits and infiltration pits
- WD5.13 (previously 5.12) Freeboard to floor levels reworded in line with DoW requirements. Added maximum surface flow depth/velocity criteria
- WD5.21 New section added to provide standards for managing stormwater runoff within private properties.
- WD5.22 New section added providing requirements for managing water quality from small rainfall events
- WD5.23 New section added providing requirements for accepting infiltration rates in sizing retention/detention facilities
- WD5.24 New section added providing requirements for accepting stormwater runoff into natural water bodies and wetlands
- WD5.25 New section added providing requirements for accepting stormwater runoff into public open space
- WD5.26 This section incorporates previous sections WD5.26 through to WD5.20 with some wording changes to clarify the City's preference for receiving environments other than sumps
- WD5.37 (previous WD5.23) Added requirements for stormwater runoff receiving environments on private land

Also the following broad changes have been made:

- Introduced the latest Department of Water (DoW) principles of small, minor and major rainfall events
- Moved away from fenced sumps as the preferred stormwater receiving environment
- Introduced POS as the preferred stormwater flood storage (retention/detention) receiving environment
- Introduced the small rainfall event water quality treatment at source concept
- Accepted infiltration rates for sizing of retention/detention facilities based on field test results
- Clarified dealing with stormwater in private lots

2014 Version 2.01 - May 2014 (Minor amendment to WD11: Vehicular Crossover Design)

The following is minor change to the City Guidelines document are a result of errors identified. The change in the document only affects WD11: Vehicular Crossover Design.

Changes in the Issue 2.01 May 2014 version:

PQ. WD11: VEHICULAR CROSSOVER DESIGN

WD11.06 – General

- WD11.06 (3) :- Clause modified specifying limitations on crossover locations.
 - The minimum setback of the crossover to a street light or street sign pole shall be 1.0 metre.

2003 REVIEW NOTES (Issue No. 2 - March 2003)

The following is a summary of changes to the City Guidelines document are a result of the 2003 standards review. The changes in the document only affects the City's coloured inserted pages (green and yellow pages). It is not intended to alter the original WA AUS-SPEC#1 document (white pages). It is considered that any review to the AUS-SPEC #1 document will be undertaken by the Institute of Public Work Engineering Australia (IPWEA). There has been no changes to the AUS-SPEC#1, Design Series document since the last version issued with the City's Guidelines.

Changes in the Issue 2 March 2003 version:

A. INSTRUCTIONS FOR THE USE OF CITY OF WANNEROO DESIGN SPECIFICATIONS

Appendix A2: Standard Forms

- Asset capture recording sheets and additional standard form added for use in association with subdivisional development works.

B. GUIDELINES FOR DEVELOPMENT AND SUBDIVISION OF LAND

City of Wanneroo green coloured page inserts

- Sections WA, WR, WE, WS – some minor changes,
- WE2-4: Hours of operation clause added,
- WE2-5: Clearing and earthworks clause added and clause numbers adjusted as a result.
- WE3-1: Earthworks and clearing clause added.
Engineering works inspection clause added.
Landscape inspection clause added.
Final inspection clause added.
- WE5-2: Reference made to the use of the new asset capture recording sheets included at the end of the 'Explanatory Note' section of the Guidelines.

C. WDQS: QUALITY ASSURANCE REQUIREMENTS FOR DESIGN

- No changes made to this section

D. WD1: GEOMETRIC ROAD DESIGN

WD1.06 - Plan Requirements

- Clause numbers rearranged

WD1.07 - Plan Requirements

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- Notes added at the end of this paragraph with respect to Figures D1.2 & D1.3.

WD1.08 – Road Network

- Clause added in relation to Development of lots with rear access lanes.

WD1.09 – Design Speed

- Note added to reflect the current regulatory speed of 50kph in built-up areas.

WD1.14 – Carriageway Width

- WD1.14 (8) :- new clause added with respect to the use of lower traffic generation rates.

WD1.17 – Intersections

- WD1.17 (5) :- new clause added with respect to intersection spacings.

WD1.18 – Roundabouts

- new clause added with respect to deflection radius at roundabouts.

WD1.19 – Traffic Calming

- WD1.19 (2d) :- Clause added with respect to vertical displacement devices.
- WD1.19 (2g) :- Clause added with respect to the provision of semi-mountable kerbing and linemarking and signage requirements.

WD1.20 – Parking

- new clauses added with respect to the provision of car parking embayments.

WD1.21 – Battleaxe Entry Roads

- WD1.21 (2) :- Clauses added with respect to battleaxe leg requirements.

WD1.27 – Carriageways (Rural)

- WD1.27 (2) :- Minimum carriageway widths altered to 6.0 metres.
- WD1.27 (3) :- New table added to show battleaxe leg requirements in special rural developments. Clause added with respect to battleaxe leg requirements in rural development.

E. WD2: PAVEMENT DESIGN

WD2.03 – Other Specification

- WD2.03 (b) :- References to Cement & Concrete Association of Australia & Concrete Masonry Association of Australia specifications updated.

WD2.08 – Pavement and Surfacing Materials

- Note added with respect to the limitations in the use of Laterite based asphalts.

WD2.19 – Asphaltic Concrete

- Table 1 : Design Criteria modified. The minimum asphalt thickness on urban arterial standard roads is now 30mm. Instead of 25mm. The seal to be used for Access Roads and Distributor Road in rural standard roads is 10mm Stone Chip Seal instead of 14mm.

F. D3: STRUCTURES BRIDGE DESIGN

- No City of Wanneroo pages added to this section

G. D4: SUBSURFACE DRAINAGE DESIGN

- No City of Wanneroo pages added to this section

H. WD5: STORMWATER DRAINAGE DESIGN

WD5.04 – Design Rainfall Data

- WD5.04 (5) :- Clause added to include the 10 year Average Recurrence Interval design criteria for arterial roads

WD5.09 – Minor System Criteria

- WD5.09 (4) & (5):- Paragraphs modified to clarify the requirements of overland escape routes for stormwater runoff during major events and the provision of side entry pits at all low points.

WD5.10 – Pits

- WD5.10 (4) :- Clause modified to limit the outlet pipes from side entry pits to the maximum of 450mm diameter instead of 600mm.

WD5.27 – Design Details (Drainage Sumps)

- Clauses renumbered
- WD5.27 (2) :- Clause rearranged and a new clause added with respect to slope stability of sumps.
- WD5.27 (4) :- New clause added with respect to secondary storage.
- WD5.27 (5) :- Clause modified to provide methodology for designers considering alternative sump designs.

WD5.30 – Open Basins

- WD5.30 (1) :- Clause modified to include depth of ponding requirements for a 1 in 10 years Average Recurrence Interval storm event including a clause addressing health and safety issues associated with direct stormwater discharge into unfenced basins.

WD5.31 – Application (Road Crossings)

- WD5.31 (4) :- Clause reworded to indicate that all reinstatements are to be undertaken by contractor immediately following the works or at the request of the City.

IJ. WD6: SITE RE-GRADING

WD6.05 – Special Treatment of Particular Areas

- WD6.05 (6) :- Clause modified to limit the maximum grade for recontouring for Public Open Space areas to maximum grade of 1 in 8. The City may however approve grades upto 1 in 6 in certain circumstances.

K. WD7: EROSION CONTROL AND STORMWATER MANAGEMENT

- No City of Wanneroo pages added to this section

L. WD8: WATERFRONT DEVELOPMENT

- No changes made to this section

M. WD9: CYCLEWAY AND PATHWAY DESIGN

WD9.05 – Planning Concepts

- WD9.03 (3) :- Clause added with respect to footpaths located along a zero boundary alignment.

WD9.10 – Minimum Design Standards

- WD9.10 (1b) :- Clause amended for contraction joint spacings for footpaths, from 1.65m to 1.25m. equally spaced between expansion joints.

NO. D10: BUSHFIRE PROTECTION

- No City of Wanneroo pages added to this section

PQ. WD11: VEHICULAR CROSSOVER DESIGN

WD11.06 – General (Urban Crossover Design)

- WD11.06 (3) :- Clause modified specifying limitations on crossover locations.

WD11.07 – Concrete Crossovers

- WD11.07 (2) :- Clause modified specifying the minimum crossover width as 3.0m.

WD11.08 – Block Paving Crossovers

- WD11.08 (4) :- Clause modified specifying the minimum crossover width as 3.0m.

R. WD12: ROAD FURNITURE AND STREET LIGHTING DESIGN

- No changes made to this section

S. WD13: LANDSCAPE DESIGN (NOT YET AVAILABLE)

- No changes made to this section

T WD14: RESERVES & PUBLIC OPEN SPACE DESIGN (NOT YET AVAILABLE)

- No changes made to this section

UV. WD15: PROPERTY DEVELOPMENT DESIGN

WD15.07 – Parking Design Detail

- WD15.07 (2) :- Clause modified specifying the minimum Disabled parking bay width as 3.8m instead of 3.2m.

WD15.08 – Roof & Carpark Drainage

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- WD15.08 (2) :- Additional information provided specifying design requirements for on-site storage of stormwater drainage.