

Forrestdale Business Park East – Drainage and Pavement Requirements

The City receives many requests for information from developers in the Metropolitan Redevelopment Authority (MRA) controlled Forrestdale Business Park (FBP) concerned with the requirements for stormwater drainage and pavement areas on lots.

As the FBP is subject to a Local Water Management Strategy (LWMS) which was prepared by the Armadale Redevelopment Authority (ARA) and approved by the Department of Water (DoW), the City has adopted standards consistent with, and to meet the intent of the LWMS. The City's standards have been endorsed by the DoW.

In addition to meeting the drainage requirements of the LWMS, applications for development in the FBP need to comply with all conditions of the MRA and the City's crossover specifications available from the City's website.

The LWMS makes the following requirements of individual developments in the Forrestdale Business Park East:

- Provide onsite detention for the water incident to the site from the one year one hour storm.
- Maintain a minimum pervious portion of 30% of the development area. Where developments create less than 30% of the total area as pervious surfaces, employ some additional stormwater measures.

The City has set the following requirements for stormwater drainage

- Provide storage for the water incident to the lot area from the one year one hour storm prior to discharge to the council system. Infiltration is not considered in the one year one hour storage. For developments having impervious surfaces greater than 70% of the lot area then 100% of the lot area shall be taken as impervious for stormwater calculations.

- Rainwater incident to the site from the one year one hour storm is to be calculated using the Bureau of Meteorology data for Armadale – 17.7mm of rainfall.
- Using the Rational Method a minimum co-efficient of runoff (C) of 0.9 is to be used for impervious surfaces.
- The lot stormwater drainage system is to allow for infiltration into the ground to occur.
- The base of infiltration devices are required to be minimum 300mm above the Controlled Groundwater Level (CGL) taken as the invert of the appropriate portion of subsoil system in the street network surrounding the development. Information on the subsoil network is available from the City on request.
- Stormwater drainage is to be an interconnected system connected to the council system via the provided lot connection pits.
- Discharge to the council system is prohibited prior to mobilisation of the one year one hour storage provided in the lot drainage system.
- The lot drainage system needs to empty the water detained from the one year one hour storm via infiltration in less than 24 hours. If this is not achievable then 50% additional storage may be provided to compensate. If no infiltration testing is completed then an infiltration rate of 1m per day shall be used.

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- Prevent surface run off from the lot to the council system or neighbouring lots via gentle surface contouring of the lot pavement areas to create a crest at lot boundaries resulting in some surcharge surface storage. Surface storage 80mm – 100mm maximum depth.
- The use of infiltrating pavements, such as pervious brick or asphalt pavements, are encouraged where practicable by the MRA, DoW and the City.
- All lot surfaces are to be sealed and bound by a garden bed via an appropriate planting scheme. Hardstand and car park areas shall receive some form of seal i.e. asphalt, brick pave, concrete.
- Crossovers are to be designed in accordance with the City’s cross over specifications and in consideration of the street geometry. Infrastructure and services located in the street reserve will not be modified to suit private crossovers.
- Where Crossovers transit the swale system located in the road verge then the standard crossover detail will apply.

$$\begin{aligned} \text{Percentage Impervious} &= 14,000 \text{ m}^2 / 15,000 \text{ m}^2 \times 100 \\ &= 93.3\% \end{aligned}$$

Therefore use 100% of lot area for calculation of one year one hour storage.

Using the Rational method

$$\begin{aligned} \text{CIAD}/1000 &= (0.9 \times 17.7\text{mm} \times 15,000 \text{ m}^2 \times 1\text{hr}) / 1,000 \\ &= 239\text{m}^3 \text{ storage required} \end{aligned}$$

Where: C = Co-efficient of run-off,
I = intensity of rainfall (mm)
A = Area (m²)
D = duration (hrs)

Notes

The City and MRA are willing to consider novel approaches to stormwater detention including the use of lot swales, infiltrating culverts, tree pit storage etc.

The stormwater manual WA is a freely available resource from the DoW website and provides guidance on stormwater design and calculation. The manual contains advice on all aspects of stormwater design inclusive of Best Management Practices including infiltration devices.

This fact sheet details the City’s minimum requirements for stormwater drainage on developments in the FBP. Whilst conformance to the requirements will aid completion it does not guarantee compliance with Development Application or Building Permit conditions.

Example

Warehouse development on a 15,000m² lot comprised of:

Impervious Surfaces	
Warehouse Roof	10,000m ²
Car Park	1,000m ²
Service Yard	3,000m ²
Total Impervious	14,000m²

Pervious Surfaces	
Landscape Strip	300m ²
Side Boundary Planting	700m ²
Total Pervious	1,000m²