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DRAFT

ON-SITE STORMWATER DETENTION POLICY (OSD)

ACT Infrastructure Management - Stormwater

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1 BACKGROUND

1.1 Existing System

The existing stormwater system has been developed over a long period of time dating back to the inception of Canberra in the 1920's. Drainage design standards and methods have evolved throughout this period and many of the areas developed in the early stages are now below currently accepted standards for flood protection.

In particular, provision was not made for overland flow paths in the early development in some suburbs. Ainslie is a notable example. Current standards require a 'minor' and 'major' drainage system. The minor system, comprising essentially the underground pipe network, caters for minor storms to prevent nuisance flooding. The major system carries runoff resulting from more intense storms, along with any overflows from the minor system, via roads, overland flow paths, and formal floodway systems. Furthermore, there are some areas which have been developed with 'rubble soakage pit' and/or 'drain to kerb' stormwater systems rather than the standard pit and pipe reticulation network.

With the more recently developed outer suburbs (since the early 1970's) the design of the stormwater system has mainly been carried out in accordance with contemporary standards. In keeping with economic constraints, the stormwater system design in these areas (as well as the older areas) does not include any deliberate allowance for spare capacity. Major and minor stormwater systems have generally been designed for standard residential development density of around 10-15 blocks per hectare.

In summary, there is essentially no spare capacity in the existing stormwater drainage system. In fact, there are areas of Canberra, notably the inner areas, which are already well below currently accepted standards for the level of flood protection of leased properties.

1.2 Impact of Urban Consolidation

Firstly it must be recognised that, in general, additional development in existing areas will increase stormwater runoff thereby placing additional hydraulic load on the existing system. The runoff coefficient, determined by the surface characteristics of the sub catchment, increases significantly as land use changes from a 'green field' site through standard residential, medium and high density residential developments to commercial development.

As pipe systems generally have no spare capacity, the net effect of urban consolidation will be to increase the quantity and frequency of occurrence of overland flows. The incidence of nuisance flooding within leases and along roads may increase significantly. Road flows may increase to the point where vehicle stability and hence danger to traffic may become a major problem. Consequently, damage to public property and costs to the community at large (insurance companies, private individuals, etc) would increase.

Local redevelopments, especially in the inner city areas, have already occurred. The developments have proceeded independently over a period of time with each successive development contributing a small increase in runoff. The cumulative effect has now had a significant impact on some areas such as Turner, Braddon, Forrest and Yarralumla.

2. ON-SITE STORMWATER DETENTION (OSD)

2.1 What is OSD?

OSD is the temporary storage and controlled release of stormwater runoff generated within a block. Runoff from roof areas, paved or concrete surfaces, lawns, and landscaped areas is piped to or otherwise collected in a suitable storage area or tank on the site (Site Storage Requirement). The outflow from the storage to the municipal stormwater system is limited to a predetermined rate (Permissible Site Discharge) which is usually the rate before redevelopment. The storage will be constructed in such a way that it will completely empty after the storm has passed.

Storage of stormwater runoff may be provided on the surface or in underground structures within the site. Options for storage range as follows;

(a) *Underground storages* - typically tanks or larger diameter pipes placed beneath driveways, carports, or lawn areas. This is perhaps the most expensive means of meeting requirements and is often incorrectly perceived as the only means of doing so.

(b) *Surface storages* - typically provided in landscaped areas, car parks, tennis courts, driveways, and paved areas. These are usually the most economical as often, with some thought, the dual use of areas or facilities can be utilised.

Combinations of underground and surface storage can be provided where larger volumes are required or where it is desirable to reduce the frequency of surface ponding.

2.2 Why OSD?

Many municipal councils in Sydney and Melbourne have adopted OSD as a viable means of combating the adverse effects of urban consolidation. OSD is being applied to development sites for the following reasons;

- additional discharge from a developed site could cause the existing street drainage and trunk drainage systems to surcharge
- the cost of upsizing or augmenting existing drainage systems is usually beyond the financial means of councils (and the community)
- as development usually decreases the time taken to drain a site, as well as increasing the proportion of impervious area, an increase in peak runoff results
- there is a need to protect downstream and adjacent properties from flooding because of increased site runoff
- OSD may utilise the spare capacity available in a drainage system at times other than peak catchment discharge
- OSD is a practical and cost effective solution for disposing of increased volumes of runoff
- often land is not available for alternative community-based detention basins

There is a need for detention because;

- planning principles have been relaxed over time and higher density development is now allowed outside of its historic zoned areas
- large old leases are being re-subdivided
- larger dwellings are being built
- impervious areas are increasing because of the demand for more paving, tennis courts, swimming pools, patios, barbeques, and concrete or paved driveways
- people often opt for additions to their home instead of moving to another residence, thereby increasing the amount of impervious roof area
- redevelopment usually results in loss of infiltration, loss of surface storage, and loss of vegetation which means less evaporation and evapotranspiration

2.3 What will OSD cost?

A study recently undertaken in Sydney indicated that the average cost to provide OSD facilities varied from approximately $9 per square metre increase of impervious area for dual occupancies to approximately $50 per square metre increase of impervious area for townhouse and unit developments. Based on typical developments, indicative costs per development are indicated in Table 2;

Table 2

Development Type	Above Ground Storage	Below Ground Storage
Dual Occupancies	$100 - $500	$1,500 - $5,000
Townhouses and Units	$200 - $800	$5,000 - $10,000

The cost of providing OSD could vary significantly due to a number of factors related to the site and the scope and type of development being proposed. As designers become more familiar and experienced with OSD, innovative approaches and cost effective designs could be incorporated in the development at the concept phase instead of being tacked on as an afterthought.

2.4 Effect of OSD

The requirements for OSD have been determined to cater only for the effects of redevelopment and will not be applied to rectify inadequacies with existing municipal stormwater systems. Deficiencies in these systems should eventually be corrected where warranted by publicly funded capital works projects.

2.5 Advantages and Disadvantages

The main advantages of OSD are as follows;

(a) OSD prevents an occurrence of more severe and frequent flooding as a result of redevelopment.

(b) Flooding problems are not transferred to some point in the downstream catchment which can be the case when localised sections of the municipal stormwater system are duplicated or enlarged.

(c) Drainage problems are solved at their source, as they occur, and as a result, solutions are not postponed.

(d) The risk of providing expensive stormwater infrastructure that may not be utilised if redevelopment potential is not realised is avoided.

(e) The benefit of OSD is immediate and is independent of the rate or timing of redevelopment.

(f) Apart from some initial and recurrent administration costs, OSD can be provided at minimal public expense.

The main disadvantages of OSD are as follows;

(a) Ongoing maintenance is the responsibility of the lessee or Body Corporate and there could be a lack of owner awareness and/or willingness to undertake maintenance.

(b) Lack of understanding of OSD by designers, builders, and owners.

(c) Lack of departmental resources and/or commitment to OSD.

These disadvantages will largely be overcome with familiarity and understanding of the process.

3. OSD POLICY

3.1 Policy Statement

The overall aim of the OSD policy is to ensure that, for storm runoff up to and including 100 Years ARI, new developments and redevelopments do not increase peak stormwater flows in any areas downstream of these developments.

3.2 Policy Objectives

The objectives of the OSD policy are to:

- prevent any increase in downstream peak flows resulting from new developments or redevelopments by temporarily storing on-site the additional runoff generated
- prevent any increase in downstream flooding or other drainage problems that could;
    - increase flood losses
    - damage public assets
    - reduce property values
    - require additional expenditure on flood mitigation drainage works

3.3 Policy Application

OSD shall be required for all developments where the applicable impervious area of the site is greater than the limits shown in Table 3.

Table 3
Maximum Permissible Impervious Area

Original Land Use	Impervious Area Considered	Impervious Area Limit (% of total site area)
Residential:		
single dwellings	Gross floor area *	25%
multi units	All impervious areas	65%
dual occupancies	OSD mandatory	not applicable
Commercial	All impervious areas	80%
Industrial	All impervious areas	90%

* Gross floor area shall include all dwellings and structures which require Design & Siting approval.

In the case of redevelopments, except for dual occupancies, OSD shall be required when the limit applicable to the originally designated land use is exceeded. For example, a consolidation of single residential blocks to a townhouse development will require OSD if the total impervious area of the townhouse development exceeds 25%. A townhouse redevelopment of a commercial site will only require OSD if the total impervious area exceeds 80%.

The policy shall generally apply to all types of development permitted by the provisions of the Territory Plan, including the following:

- all commercial, industrial and special-use developments and buildings
- town houses, villas, home units, duplexes
- dual occupancies
- single block developments
- subdivision redevelopments
- tennis courts
- roads, carparks, paths and other sealed areas
- public buildings

The policy shall not apply to:

- any redevelopment where the total impervious area for the proposed site is less than or equal to the total impervious area of the existing site
- change of use where no physical changes to the outside of the property are proposed
- boundary adjustments and consolidations of leases where no potential or expectation of additional development is created
- areas within properties not subject to a development or building application

Note: This policy supersedes the interim OSD policy applied from January 1996 as a condition of Design & Siting approval.