Onsite Detention

The following describes the content and options available under the Onsite Detention tab:

Site Storage Requirements

SSR is the Maximum storage of On-Site Detention Unit defined in m³/HA of developed area.

It is common for an Authority to nominate a minimum SSR requirement for an on-site detention unit within an individual allotment development. xprats can therefore simulate an individual allotment with a node at the outlet point of every allotment or simulate the accumulative effects of a number of allotments within a single xprats sub-catchment. The developed portion of the sub-catchment is the area enclosing all allotments that contain individual on-site units. For example if the sub-catchment contains parkland that will not include a on-site detention unit then the developed portion of the sub-catchment will be less than the total sub-catchment. The SSR dictated by an authority will be in m³/ha and will only relate to the area of the allotment itself.

Primary Permissible Site Discharge

(PSD) is the maximum Primary Permissible Site Discharge of the On-Site Detention Unit defined in l/s/ha of developed area. The outlet is usually at the invert of the unit.

Secondary Permissible Site Discharge

This is the maximum permissible discharge for an optional second discharge point from an On-Site Detention Unit at a higher elevation within the unit’s outlet orifices. The reason for an optional second higher outlet point with different diameter is to allow the optimizing of units to meet down stream maximum peak flow requirements for two different flow frequencies. For example the 5year return period for piping requirements with only the lower outlet operating and then the 100 year flood flow requirements with both primary and secondary outlets operating. Note by running simulations to limit the 5 year flow peak downstream to the pre-developed level it is possible by iteration to determine appropriate SSR and primary PSD. These runs will also provide the maximum water level in the detention unit. This level will then be used to set the height of the secondary outlet whereby its size can be adjusted to meet downstream maximum peak requirements in the 100 year return period event. Note it will be necessary to run a range of ARR storm durations to locate the one that produces the maximum water level in the detention unit.

Primary Height to Spill

This is a vertical measure in (m) between the invert of the OSD’s lower outlet and the invert of the secondary upper orifice outlet (OWHT).

Secondary Height to Spill

This is a vertical measure in (m) between the lower outlet invert and the spill level of the OSD spillway.

This is a flag to indicate if a high early discharge (HED) pit is in operation. If it is then the maximum discharge rate is reached almost immediately after a relatively small volume inlet pit is filled prior to water discharging into the main OSD. If no HED is utilized the discharge rate for the outlet/s is progressively increased to the Permissible Site Discharge (PSD) at a stage equal to the Primary Height to Spill (LWHT). This will be equal to the invert of the secondary upper outlet if there is one.

Spill Width
Width of spillway (m).

Type of OSD System
Select the appropriate shape.

HED
Check if the outlet orifice can be controlled by a high early discharge