

# Developer Services

*Design Requirements for Surface Water Attenuation Assets*

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Blueprint for Yorkshire



YorkshireWater



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## DOCUMENT CONTROL

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# Design Requirements for Surface Water Attenuation Assets

The purpose of this document is to provide developers and designers with a guide to Yorkshire Water's design requirements for surface water attenuation assets.

## Detention Basins

The detention basin should normally be dry. The designer / contractor / developer shall provide water table levels taken monthly over a period of twelve months and borehole information over four consecutive seasons for at least three points in the basin area. Ground conditions must be suitable to allow free drainage from the detention basin all year round by having regard to groundwater levels.

The detention basin shall be designed to ensure that there is a minimum of one metre of unsaturated soil between the maximum groundwater level and the lowest part of the structure.

To help prevent standing water conditions from developing, impermeable basin liners are not to be used.

In residential situations, a fence will only be required if a risk assessment, undertaken by Yorkshire Water, indicates it is needed. However, in commercial and remote sites, the detention basin shall generally be fenced with 2.4 metre high steel palisades (BS 1722-12:1999 type GP18).

A minimum 3 metre strip around the perimeter of the detention basin shall be provided to allow the access of a van or dumper truck for maintenance purposes. Where fenced, this shall be within the fenced area. Where unfenced, this shall be included in the land to be conveyed to Yorkshire Water. Vehicular access, and the right for vehicular access to the detention basin, will be required.

The side slopes of the detention basin shall be no steeper than 1 in 3.

The detention basin must be designed to cater for a minimum storage of a 1:30 year storm event and a maximum water depth of water in the basin shall not exceed one metre.

The detention basin floor, sides and embankment top shall be provided with a minimum 150mm deep layer of engineered soil (high quality topsoil with a loam or sandy loam texture), seeded with a slow growing general amenity grass .

The detention basin can be on or off line:

- for **off-line basins**, the basin floor shall be laid at 1:100 (or steeper) towards the basin outlet;
- for **on-line basins**, a scour resistant dry weather flow channel shall be provided, laid to fall at 1:100 (or steeper) from the basin inlet towards the basin outlet and the basin floor shall be laid at 1:100 (or steeper) towards the dry weather flow channel.

Detention basins shall be designed to minimise silt accumulation in the basin and / or dry weather flow channel. To achieve this, the 1:1 and 1:2 year storm event should be kept out of the basin. Alternative sedimentation management options will be taken under consideration.

At preliminary / outline design stage, the designer / contractor / developer shall provide a value, in cubic meters, of the potential escapable volume following a potential breach / failure of any man made embankment or barrier.

Yorkshire Water will take on the maintenance of the detention basin. The developer must pay a commuted sum based on the future maintenance of the basin over a 25 year period.

Physical and legal rights of access and land ownership shall be established as soon as possible. For all assets vested via Yorkshire Water Developer Services, requests for land transfer and any rights of access, shall be initially agreed in principle, and the actual areas of land to be transferred shall be formalised once the assets have been constructed. All fees for transfer of land and rights of access shall be at the developers expense, if forming part of the S104 application.

## Flow Control Chambers

The minimum size opening for an orifice plate is 100mm.

The minimum orifice for a vortex flow control is 75mm.

The diameter for flow control chamber is dependent on the number and size of the sewer outlets / inlet. It is also dependent on the size of the flow control unit and drain down pipe. The minimum diameter of the flow control chamber is 1800mm.

Ladders / step rungs will not be required, as man access to the chamber will be via a winch. The clear opening of the access point should be a minimum of 1200mm x 600mm with lockable fall arrest grille and fitted with a double twin 600mm x 600mm D400 cover.

A vortex flow control chamber requires a sump with a minimum width of 450mm from the front of the control unit to the base of the ramp.

An emergency drain down galvanised steel penstock must be provided to enable manual drain down of the flow control chamber. The penstock must be able to be operated from the surface.

For maintenance purposes, vehicle access to the chamber (including a tanker) will be required.

For flow control chambers located some distance from the highway, a three metre wide bitumen macadam or concrete access way with turning head will be required to within five metres of the flow control chamber. Yorkshire Water shall also require a right of vehicle access in perpetuity over this access way.

## Access to Large Diameter Surface Water Storage Pipes and Tanks

For **large diameter surface water storage pipes**, with a diameter of 900mm or greater, the access point must be suitably sized for man access via a winch. The access point should have a clear opening of 1200mm x 600mm and a lockable fall arrest grille with a double twin 600mm x 600mm D400 cover fitted. Ladders / step irons will not be required.

For **surface water storage tanks**, Yorkshire Water requires access points over each inlet and outlet. If the surface water tank is less than 1.8 metre in depth, an access point on each lane is required. (this can include the access point over an inlet / outlet). If the surface water tank is equal to or greater than 1.8 metre in depth, four access points are required, one at each corner (this can include the access point over an inlet / outlet). Ladders / step irons will not be required.

The outlet access point must be suitably sized for man access via a winch (minimum of 1800mm diameter ring). The required minimum clear opening for the cover should be 1200mm x 600mm. A double twin 600mm x 600mm D400 cover with a lockable fall arrest grille must be fitted. Ladders / step irons will not be required.

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