

TECHNICAL GUIDELINE**GUIDELINES FOR THE DESIGN OF PIPE END
DISSIPATORS**

Issued by: Manager Engineering

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Major Changes Incorporated In the July 2002 Edition

The following lists the major changes to the July 2002 edition of TG 104, which have been incorporated in this edition:

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Section 1: Application

These dissipators are suitable for tank overflows, scour outlets, storm drain outlets, etc

1.1 LOCATION AND SCOUR PROTECTION

Typical: A dissipator should be set in an area of flat ground (or at creek bed level), and surrounded by compacted riprap with a minimum thickness of 300 mm and a width of 1000 mm. The riprap stone size should range from 50 to 150 mm, with the smaller stones just filling the voids between the larger stones but not keeping them apart.

Alternatives: Some situations may require the scour protection to be extended, or allow/require larger sized riprap or possibly a concrete apron to be used instead.

1.2 DISSIPATOR CHAMBER

Typical: A precast concrete pipe of appropriate diameter and length-to-diameter ratio (see below for calculation), with the top set 300 to 600 mm above finished ground surface, and horizontal to within +/- 5 mm. If the top is a cut end, the cut is square to the pipe and straight to within +/- 5 mm. The top is fitted with a lockable grid cover for safety, and a 50 mm drain hole 100 mm down from top to keep the grid cover dry when there is no flow.

Alternatives: A square or rectangular, pre-cast or cast-in-situ box may be used. Top may be set up to 1000 mm above finished surface. The cover may be deleted.

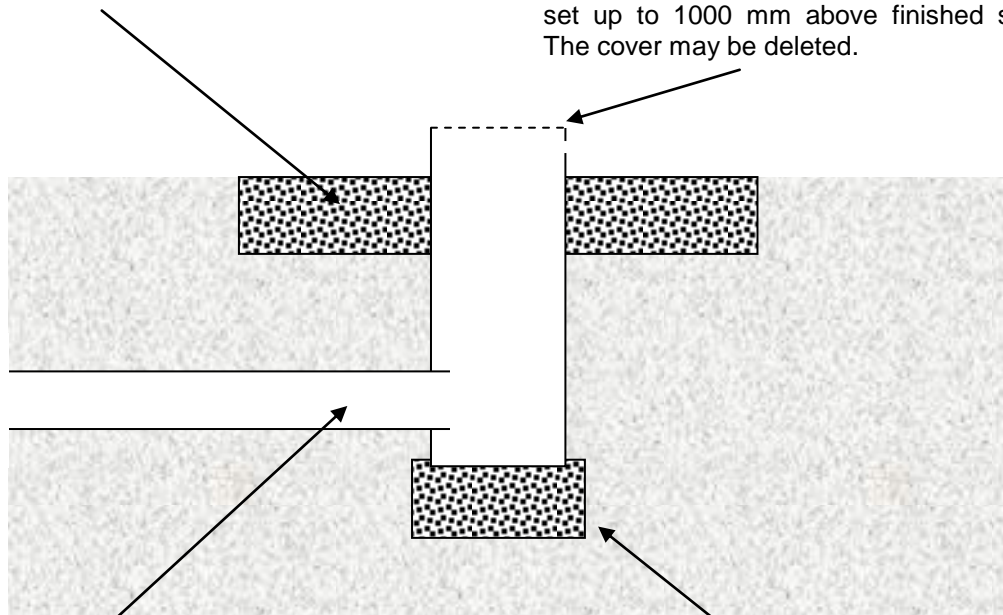


Figure 1.1 - Dissipator Chamber.

1.3 INLET PIPE

Minimum cover to pipe 750 mm, and additionally as necessary to achieve grade down to the chamber and/or ensure that the pipe enters near the bottom of the chamber. Leave a sump below the bottom of the pipe of minimum depth 150 mm (300 mm for stormwater).

1.4 FOOTING FOR CHAMBER

Typical: Compacted riprap 300 mm thick, with stone size as for the scour protection.
Note: This footing will generally allow the sump to drain slowly between flow events.

Alternatives: Some situations may allow/require larger sized riprap to be used. A concrete footing may be used (consider the effect on drainage).

Section 2: Calculation of the Size of the Chamber

The cross sectional area of the chamber should be selected to give a mean upward flow velocity in the chamber not greater than 0.3 m/s, and ideally 0.1 m/s or less. (Note: a low upward velocity in the chamber also means a shallow depth of flow over the rim.)

The height of the chamber (top to bottom) should be at least 1.5 times and ideally 2 or more times the diameter (or mean width if the chamber is rectangular).

Section 3: Examples

EXAMPLE 1:



Figure 3.1 - The dissipator at the Murray Bridge WWTP Wetlands.

It is handling a flow of about 30 L/s from a 300 mm diameter rising main. This dissipator has a good depth to diameter ratio (about 2:1) and a comfortably low mean upward velocity (less than 0.1 m/s), which combine to give the excellent uniform and shallow depth of flow over the rim. The surrounding riprap copes well with the cascade height of 1 m.

EXAMPLE 2:



Figure 3.2 - A typical overflow and scour dissipator for a small tank (Wistow).

A dissipator should be set in an area of flat ground to minimise the risk of local scouring. (Water should spread around the dissipator then flow away as shallow sheet flow.) If a dissipator discharges to a drainage line or watercourse it may need to be set in the bed to avoid flow down a steep bank. Consideration should also be given to the erosion resistance (steepness, vegetation cover, etc) of the ground or bed further down the slope or watercourse. If discharging to a dam (as above) a dissipator should be set on ground close to top water level.