

HeadCell Inlet Design Considerations

Overview of Hydraulic Considerations

Wastewater Application Sheet

HeadCell® units are typically designed for 12" (30 cm) of headloss at peak hydraulic capacity and a 2-3 ft/s (0.61-0.91 m/s) approach velocity. This loss is between the water level in the influent channel and the water level in the HeadCell tank. At flows less than peak the headloss can be calculated by the following equation:

$$H_Q = (Q_Q/Q_{Peak})^2 \times H_{Peak}$$

Where:

- H_{Peak} = headloss = 12 inches (30 cm)
- H_Q = headloss in question at Q_Q (inches or cm)
- Q_{Peak} = Peak flow provided by Hydro (Mgal/d or ML/d)
- Q_Q = flow at H_Q

Notes: This equation does not account for the headloss over the weir. Both flow rate and headloss units must be in the same system of measure (imperial or metric).

The water level in the HeadCell tank is determined by the weir length and downstream conditions. This is typically the length of one side of the HeadCell tank, and the subsequent head required for peak flows to exit over the weir. Typical weir lengths are shown in Table 1.

HeadCell Diameter	Typical Weir Length
12' (3.7 m)	16' (4.9 m)
9' (2.7 m)	12' (3.7 m)
6' (1.8m)	9' (2.7 m)
4' (1.2 m)	6' (1.8 m)

Table 1. Typical HeadCell® Weir Lengths

For a 12' (3.7 m) diameter HeadCell unit the weir length is typically 16' (4.9 m). By calculating or using tables in hydraulic manuals, the headloss required to drive the peak flow over a rectangular weir can be determined. The water level upstream of the HeadCell influent duct or influent hydraulic grade line (HGL) is calculated by adding the water elevation required by the effluent weir to the peak headloss through the HeadCell unit.

Contact Hydro International at 503.615.8130 for further information.

