

Design and installation guidance: light cowl or shroud to protect wholesome water from light ingress



Storage cisterns supplied via a type AB air gap are regularly used to store water that is required to be wholesome. A weir overflow can however provide a means by which stored water may become exposed to light which is known to promote the growth of algae, where this occurs it would cause not only taste and odour problems but also provide nutrients that can support the growth of bacteria.

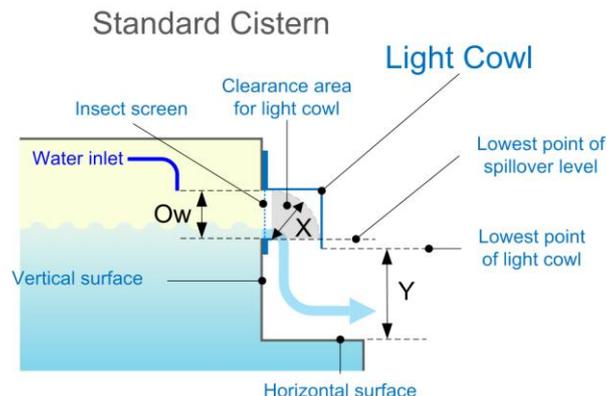
Where a risk of light ingress exists the most common way of addressing the problem is to fit a cowl or shroud that covers the weir slot.

To ensure that there is no risk of the backflow protection provided by the air gap arrangement being compromised, as a result of the light cowl impeding, or in extreme cases preventing, the water escaping during fault conditions, the following design advice has been developed in conjunction with the ATCM*. The guidance is based upon the principles detailed in BS EN 13077:2008, that define the minimum clearances between the cistern, cowl and any horizontal surfaces.

There are two key criteria which the design of a light cowl should meet:

1. It should minimise light entering the storage cistern; and
2. It should not impede in any way the discharge of contents from the cistern in an overflow situation.

To ensure that these requirements are met light cowls should be designed and installed so that:-



- the lowest point of the light cowl should be at least level with the lowest point of the spillover level of the overflow slot, although it is recommended that it extends below this level; and
- a minimum clearance (X) in all orientations is maintained between the light cowl and any vertical surface of the storage cistern; and
- a minimum clearance (Y) is maintained between the lowest point of the light cowl and any horizontal surface.
- Where an insect screen is required to protect the cistern contents, to prevent debris and dust collecting on the screen it is recommended that it be mounted vertically at the overflow slot, and installed in such a way that be readily removed to enable routine maintenance and cleaning.

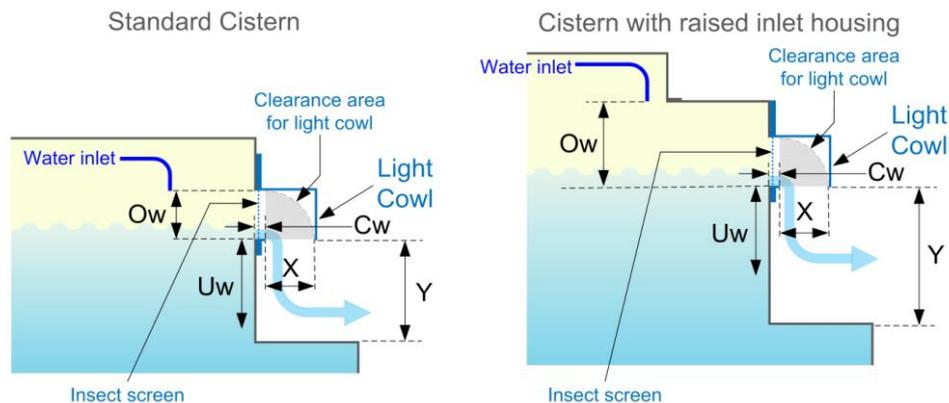
Minimum dimensions X and Y should be equal to or greater than that required by BS EN 13077:2008 for O_w (overall height of the overflow slot) when used for Type AB air gaps.

$$O_w \geq 2D + h \text{ (minimum of 20 mm)}$$

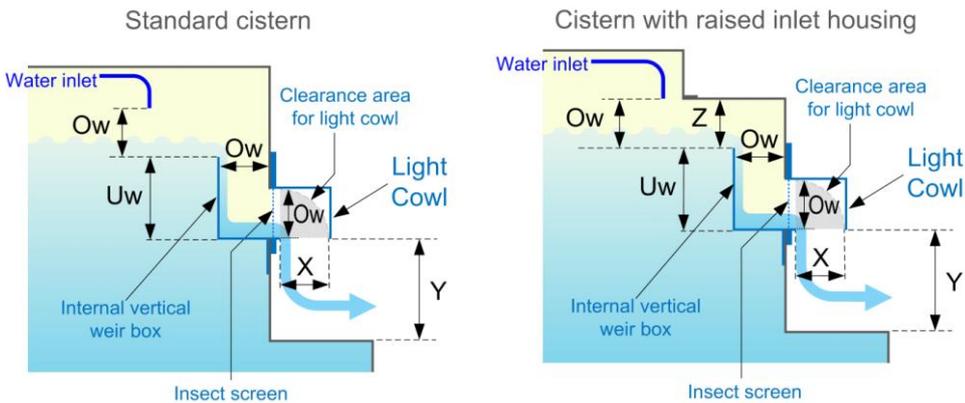
$$X \geq O_w$$

$$Y \geq O_w$$

Examples of light cowl design and installation requirements for cisterns supplied via a type AB air gap



Examples of light cowl design and installation requirements for cisterns incorporating an internal vertical type AB air gap



Key:

- Ow the minimum height of the overflow slot as measured from the lowest point of the inlet discharge point to the bottom of the overflow slot.
- Uw the minimum length of the internal vertical face immediately below the lowest point of the spillover level of the overflow slot. Uw must be equal to or greater than 5h.
- Cw the maximum distance allowed from the inside face of the cistern wall where the water will start to overflow to where the water will fall vertically downwards outside the cistern. Cw must be equal to or less than 5h.
- D the maximum internal diameter, within the last metre of the supply pipe, or the DN of the wholesome water inlet connection whichever is the greater.
- h the highest physical level the fluid reaches in any part of the cistern when operated continuously under fault conditions – i.e. the maximum combined inlet flow, outlet flow is via the overflow slot only.
- X the minimum clearance in all directions between the body of the light cowl and any vertical surface of the cistern including the weir slot and screen. This should be equal to or greater than the dimension used for Ow.
- Y the minimum clearance maintained between the lowest point of the light cowl and any horizontal surface. This should be equal to or greater than the dimension used for Ow.
- Z the minimum distance from the internal spillover level to the lowest point of the roof inside the cistern. This should be equal to or greater than the dimension used for Ow

Note: all dimensions referred to in this guidance are those used in BS EN 13077:2008 for a Type AB air gap overflow design.

*This guidance has been developed in conjunction with ATCM and has been agreed as proposed acceptable design criteria where a cowl has not been verified by test or has been validated through WRAS approval. Where a test will be carried out the impact of any cowl will be one factor the overall design and validation will take account to ensure full air gap protection.