THE WATER MANAGEMENT SOCIETY

TOOLBOX TALKS

DEAD LEGS

Dead legs an introduction - what are dead legs?

Water in dead legs and dead ends/blind ends is not displaced in everyday operation and therefore is likely to stagnate. ACoP L8 defines a dead leg as “pipes leading to a fitting through which water only passes infrequently when there is a draw off from the fitting, redundant or abandoned legs of pipework” and HSG274 Part 2 as “a length of water system pipework leading to a fitting through which water only passes infrequently when there is draw off from the fitting, providing the potential for stagnation”. HSE technical guidance HSG274 Part 2 defines a dead end/blind end as “a length of pipe closed at one end through which no water passes”.

Why do dead-ends and dead legs occur?

As defined by the HSG274 Part 2, dead-ends typically arise from a piece of pipework where something has been removed from a system (e.g. a sink from that area), and the associated piece of pipe was not removed.

Dead legs however may occur where additional elements have been added to a water system for future expansion (e.g. sinks added to hotel rooms which are not yet in use, or an additional floor of an office building not yet inhabited), or infrequent use (overflow toilet blocks or emergency showers). In these cases, due to lack of use the water stagnates in the pipework to these areas.

What are the risks?

The risk associated with a dead leg or dead end/blind end will be influenced by many factors including length and diameter of pipe, orientation, environmental conditions such as temperature of water and susceptibility of users.

A small diameter up turned spur of pipework on a flowing cold main will provide a much lower risk than a horizontal T or a down turned TMV controlled spur and where gravity may assist debris collection. Allowing water to stagnate and achieve temperatures in the range for legionella growth (20-45°C) increases the risk, as will use by immunosuppressed or high risk individuals. There are other factors such as turbulence, which varies with flow rate in the mother pipe, ratio of mother pipe to dead leg or dead end/blind end diameter, and diameter to length ratio of the dead leg or dead end/blind end. Some of these factors are not well understood. Resonance effects may be observed flushing one dead leg or dead end/blind end whilst another has little or no turbulence.

Recommended resolution

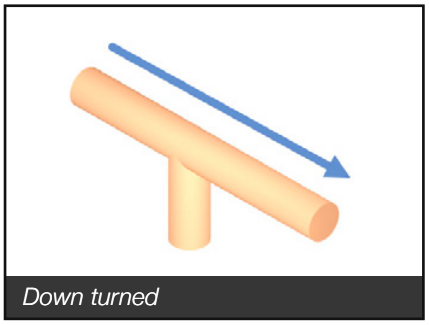
The most common question is how long is acceptable for a dead leg or dead end/blind end and authorities vary in their advice with WRAS guidance formerly suggesting no more than 2 pipe diameters as a rule of thumb and HSE guidance not specifying a minimum length or minimum ratio of length to diameter.

A judgement should be made on the risk of the particular situation with greater efforts made to remove/reduce higher risk dead ends, the ideal course of action is always to remove all redundant pipework, leaving no stub, however short. In low-risk scenarios, and if no alternative is available then the, previously stated, suggestion of no more than 2 pipe diameters remains a useful rule of thumb but this option should be regarded as the last resort and not the default.

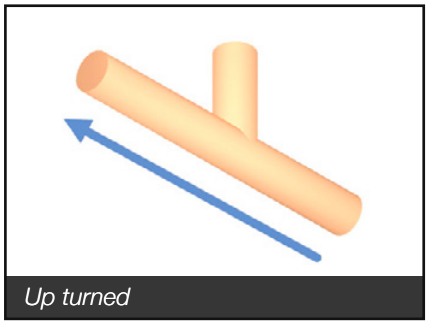
A further option, where removal is not reasonably practicable, would be to install a valve which can be flushed at least weekly to control the risk of dead-ends. The positioning of this valve should avoid introduction of additional areas of stagnation or sediment collection.

With regards to dead-legs installed for future use, if these additional items cannot be removed or isolated and drained, a schedule of regular flushing should take place to reduce microorganism proliferation.

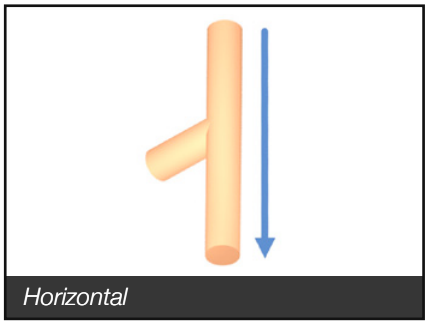
Irrespective, all such dead legs or dead end/blind ends should be carefully risk assessed, and any subsequent action justified and recorded.



Down turned



Up turned



Horizontal

DEAD LEGS