

Base Stack/Transition Areas

As the waste water discharge in a drainage stack reaches the base of the stack, it will need to change direction to flow horizontally into either a high-level collector drain or into the below-ground drainage system.

The flow velocity in the horizontal drainage pipework will be controlled by the installed gradient and pipe diameter; this will be appreciably less than the velocity of the vertical drainage stack. At the base of the drainage stack the waste water discharge undergoes a rapid deceleration in velocity, creating an increase in the depth of the flow at the change of direction. This increase in depth is generally sufficient to fill the cross sectional area of the pipe.

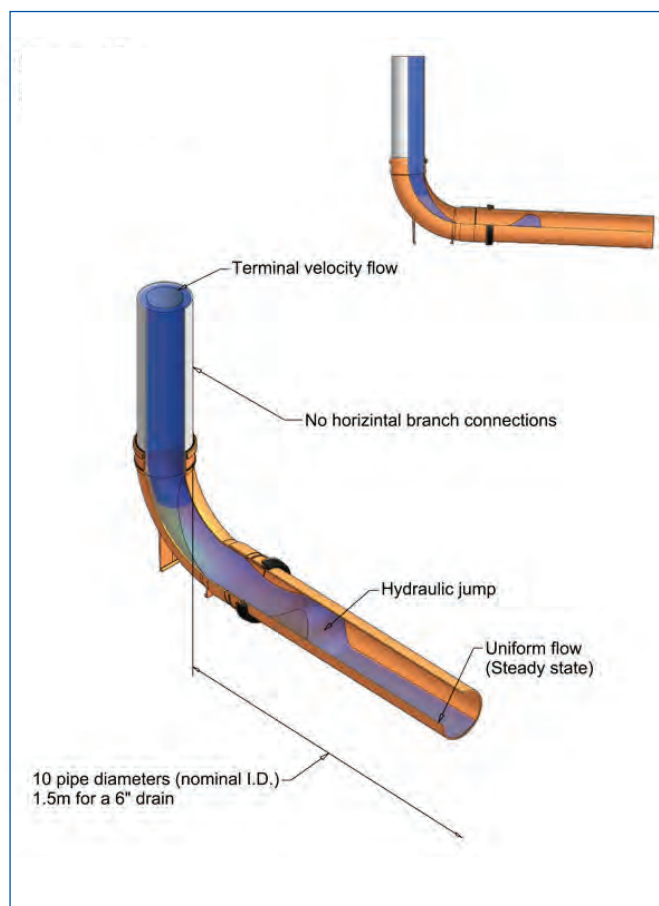
This phenomenon is known as the 'hydraulic jump'.

The distance at which the hydraulic jump occurs varies from immediately at the stack change of direction, up to 10 times the diameter of the stack downstream.

This is dependent upon:

- The entrance velocity
- Depth of water that may already exist within the horizontal drainage pipe
- Roughness co-efficient of the pipe
- Pipe diameter
- Pipe gradient
- Bend formation at the base of the stack.

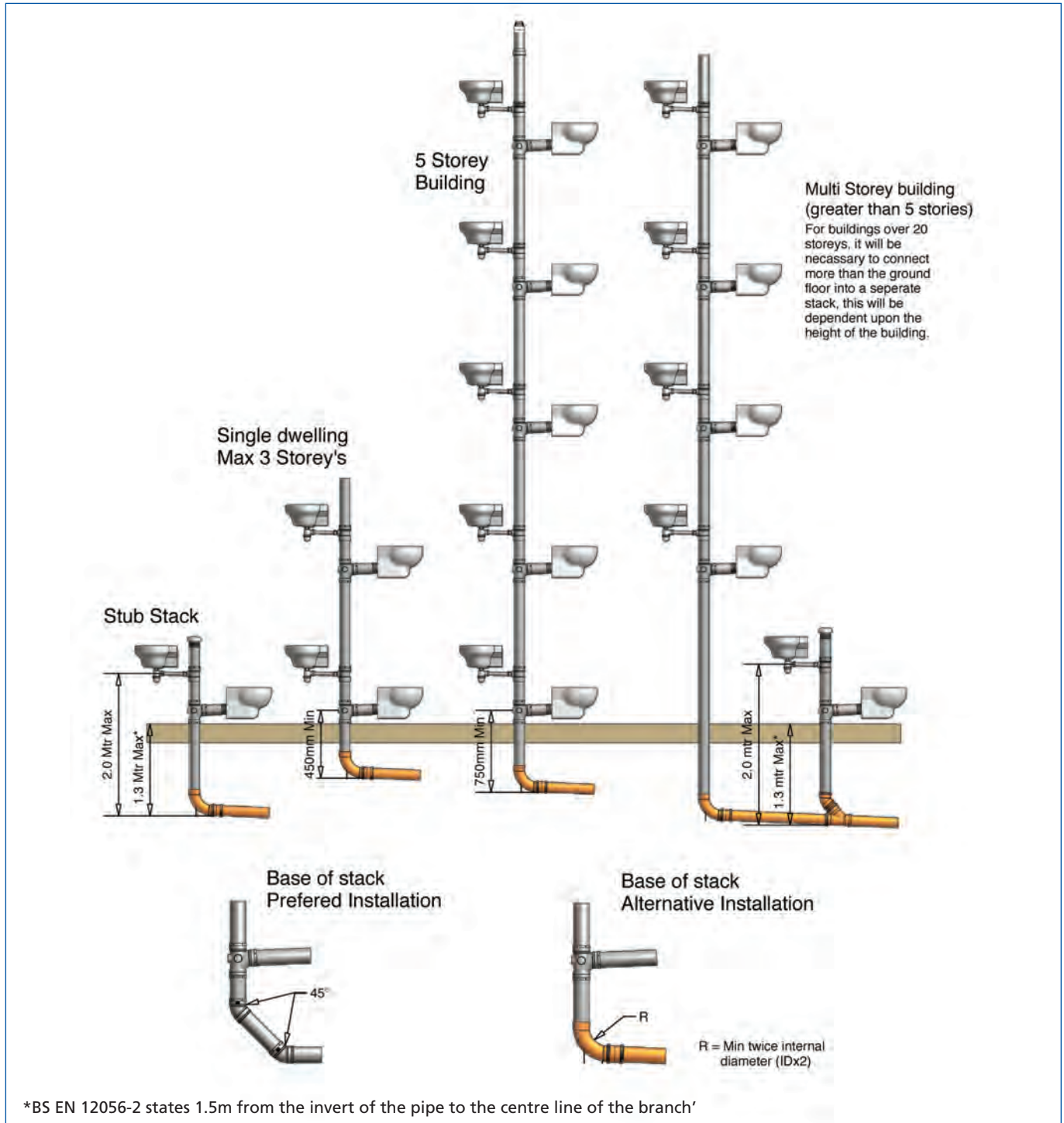
Hydraulic Jump



The surged flow condition will extend until the frictional resistance of the pipe reduces the velocity to the designed flow condition.

To mitigate the air fluctuation problems associated at the base of the drainage stack, Building Regulations Approved Document H states that the following design details are incorporated.

Base of Stack Requirements



If you would like a more detailed version of these drawings that include the appropriate product codes please contact Steve Bishop - steve.bishop@polypipe.com