

## Float Design and Installation Considerations

As the number of multi occupancy buildings, municipal buildings and large venue developments continue to increase, there is a growing demand to facilitate multiple sanitary services within the buildings.

Terrain PVC and Fuze HDPE pipework and fittings are preferred options for use in installing soil and waste floats. They are:

- Easy to install
- Easy to access pipe work for maintenance
- Reduced number of builders work holes through floor slab
- Reduced number of stacks

There is a common problem when more than one appliance is connected to a branch soil or waste pipe. When one appliance is discharged full bore, it creates a negative air pressure which can cause a suction on other appliances, resulting in the trap being siphoned.

To overcome this, BS EN 12056-2:2000, gives the following guidance on the design considerations to be incorporated.

- The gradient of a branch drain pipe should be uniform and adequate to drain the pipe
- The gradient should be designed to facilitate a self cleansing velocity
- Gradients should be between 1 and 5 degrees within a maximum distance of 3m
- Soil systems would generally have a gradient of 2.5 degrees
- Waste systems would generally have a gradient of 1.25 degrees

It is important to note that pipe diameters, gradients and pipe capacities are inter-related, this relationship is vital to prevent noisy discharge, maintain self cleansing discharge and prevent the loss of trap seals.

Appliance	Dia. DN	Min. trap seal depth (mm)	Max. length (L) of pipe from trap outlet to stack (m)	Pipe gradient	Max. no. of bends	Max. drop (H) (m)
<b>Limitations for unventilated branch discharge pipes, system III</b>						
Washbasin, bidet (30mm diameter trap)	30	75	1.7	2.2 <sup>(1)</sup>	0	0
Washbasin, bidet (30mm diameter trap)	30	75	1.1	4.4 <sup>(1)</sup>	0	0
Washbasin, bidet (30mm diameter trap)	30	75	0.7	8.7 <sup>(1)</sup>	0	0
Washbasin, bidet (30mm diameter trap)	40	75	3.0	1.8 to 4.4	2	0
Shower, bath	40	50	No Limit <sup>(2)</sup>	1.8 to 9.0	No Limit	1.5
Bowl urinal	40	75	3.0 <sup>(3)</sup>	1.8 to 9.0	No Limit <sup>(4)</sup>	1.5
Trough urinal	50	75	3.0 <sup>(3)</sup>	1.8 to 9.0	No Limit <sup>(4)</sup>	1.5
Slab urinal <sup>(3)</sup>	60	50	3.0 <sup>(3)</sup>	1.8 to 9.0	No Limit <sup>(4)</sup>	1.5
Kitchen sink (40mm diameter trap)	40	75	No Limit <sup>(2)</sup>	1.8 to 9.0	No Limit	1.5
Household dishwasher or washing machine	40	75	3.0	1.8 to 4.4	No Limit	1.5
WC with outlet up to 80mm <sup>(4)</sup>	75	50	No Limit	1.8 min	No Limit <sup>(4)</sup>	1.5
WC with outlet greater than 80mm <sup>(4)</sup>	100	50	No Limit	1.8 min	No Limit <sup>(4)</sup>	1.5
Food waste disposal <sup>(7)</sup>	40 min	75 <sup>(8)</sup>	3.0 <sup>(3)</sup>	13.5 min	No Limit <sup>(4)</sup>	1.5
Sanitary towel disposal unit	40 min	75 <sup>(8)</sup>	3.0 <sup>(3)</sup>	5.4 min	No Limit <sup>(4)</sup>	1.5
Floor drain	50	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	1.5
Floor drain	50	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	1.5
Floor drain	100	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	1.5
4 basins	50	75	4.0	1.8 to 4.4	0	0
Bowl urinats <sup>(3)</sup>	50	75	No Limit <sup>(3)</sup>	1.8 to 1.9	No Limit <sup>(4)</sup>	1.5
Maximum of 8 WCs <sup>(4)</sup>	100	50	15.0	0.9 to 9.0	2	1.5
Up to 5 spray tap basins <sup>(7)</sup>	30 max	50	4.5 <sup>(3)</sup>	1.8 to 4.4	No Limit <sup>(4)</sup>	0

Table 1 and 2 detail specific requirements relating to primary and secondary ventilated branch drain runs, in order to maintain the above, and prevent loss of trap seals.

Table 1, BS EN 12056 – Branch discharge with primary vent (System III) (ref: Table 6 BS EN 12056).

Appliance	Dia. DN	Min. trap seal depth mm	Max. length (L) of pipe from trap outlet to stack m	Pipe gradient	Max. no. of bends	Max. drop (H) m
<b>Limitations for unventilated branch discharge pipes, system III</b>						
Washbasin, bidet (30mm diameter trap)	30	75	3.0	1.8 min	2	3.0
Washbasin, bidet (30mm diameter trap)	40	75	3.0	1.8 min	No Limit	0
Shower, bath	40	50	No Limit <sup>(2)</sup>	1.8 min	No Limit	No Limit
Bowl urinal	40	75	3.0 <sup>(3)</sup>	1.8 min	No Limit <sup>(4)</sup>	3.0
Trough urinal	50	75	3.0 <sup>(3)</sup>	1.8 min	No Limit <sup>(4)</sup>	3.0
Slab urinal <sup>(3)</sup>	60	50	3.0 <sup>(3)</sup>	1.8 min	No Limit <sup>(4)</sup>	3.0
Kitchen sink (40mm diameter trap)	40	75	No Limit <sup>(2)</sup>	1.8 min	No Limit	No Limit
Household dishwasher or washing machine	40	75	No Limit <sup>(3)</sup>	1.8 min	No Limit	No Limit
WC with outlet up to 80mm <sup>(6) &amp; 14)</sup>	75	50	No Limit	1.8 min	No Limit <sup>(4)</sup>	1.5
WC with outlet greater than 80mm <sup>(6) &amp; 14)</sup>	100	50	No Limit	1.8 min	No Limit <sup>(4)</sup>	1.5
Food waste disposal <sup>(7)</sup>	40 min	75 <sup>(8)</sup>	3.0 <sup>(3)</sup>	13.5 min	No Limit <sup>(4)</sup>	3.0
Sanitary towel disposal unit	40 min	75 <sup>(8)</sup>	3.0 <sup>(3)</sup>	5.4 min	No Limit <sup>(4)</sup>	3.0
Bath drain, floor drain	50	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	No Limit
Floor drain	70	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	No Limit
Floor drain	100	50	No Limit <sup>(3)</sup>	1.8 min	No Limit	No Limit
5 basins <sup>(9)</sup>	50	75	7.0	1.8 to 4.4	2)	0
10 basins <sup>(9) &amp; 10)</sup>	50	75	10.0	1.8 to 1.9	No Limit	0
Bowl urinals <sup>(9) &amp; 11)</sup>	50	70	No Limit <sup>(3)</sup>	1.8 min	No Limit <sup>(4)</sup>	No Limit
More than 8 WC's <sup>(5)</sup>	100	50	No Limit	0.9 min	No Limit	No Limit
Up to 5 spray tap basins <sup>(9)</sup>	30 max	50	No Limit <sup>(3)</sup>	1.8 to 4.4	No Limit <sup>(4)</sup>	0

Table 2, BS EN 12056 – Branch discharge with secondary vent (System III) (ref: Table 9 BS EN 12056).



Fig. 1

Secondary ventilation can be incorporated using smaller diameter pipework, extended above the spill over level of the appliances (fig. 1) or by using a suitably sized air admittance valve(s). These types of floats are ideal for Terrain's Pre-Fabrication department to produce, allowing for easy installation on site which saves time and on site waste it also helps to improve health and safety on site.

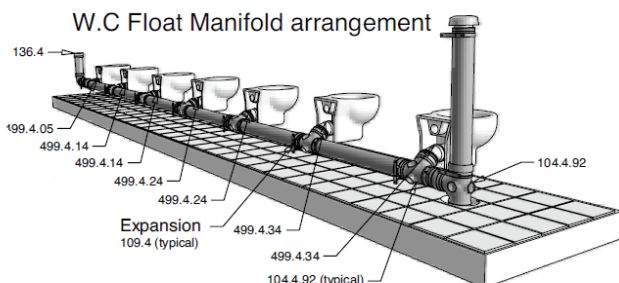


Fig. 2

An alternative and easy method of collecting and discharging a range of WC pans is using a horizontal pipework float above the floor slab. The soil float connects direct to the receiving soil stack. The flow velocity in the horizontal drainage pipework will be controlled by the installed gradient, pipe diameter, and resulting hydraulic mean depth. The horizontal float is typically installed at a 1° gradient, 17mm/m (1:60).

It is possible to connect up to 7 WC pans either side of the soil stack before secondary ventilation is required (fig. 2), this is based on BS 5503 WC pans with a spigot outlet height of 190mm (centre) from floor slab.

Terrain produces WC connectors at different angles to allow for the fall in the pipe over its length, whilst maintaining the same pan height for the length of the float.

Back to back floats are ideal for use in buildings that have multiple WC cubicles, allowing for up to 14 WCs to be connected on one float to a single stack (fig. 3). Provisions should be made for adequate access to rod the float and for a suitable flow of air through the pipe work, using vents to atmosphere or suitable AAV's.

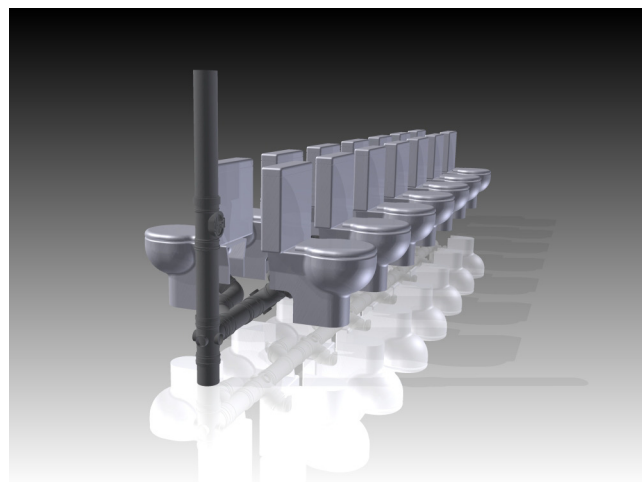


Fig. 3

When installing back to back WCs, it is advisable to use staggered connections to prevent cross flow (fig. 4) using a Terrain 104.4.92 and a 104.4.135 branch to offset the junction.



Fig. 4

A double branch must not be used as this would allow cross flow to occur (fig. 5).



Fig. 5