CHAPTER 5
SANITARY FITMENTS AND PIPING IN BUILDINGS

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Sanitary Fitments

Grouped in two categories:

a) Ablution fitments
   • Wash basins
   • Bath tubs
   • Shower trays
   • Kitchen sinks

b) Soil fitments
   • Water closets
   • Urinals
Assembling the Wash Basin

- **Tap or mixer valve**
- **Wall**
- **Cold or hot water supply pipe**
- **Overflow**
- **Cock valve**
- **Waste water discharge pipe**
- **Flexible connection**

**In Summary:**
- Taps or mixers can be either fitted on the walls or on the wash basins.
- A mixer valve is used when hot and cold water is available.
- The object of a water (or running) trap is to avoid bad odours from the sewer.
- Flexible connections are used to connect the taps or mixers to water supply pipes.
- Cock valves are used to cut off the water for repair and maintenance work.
How Running Trap Works

Bottle-running trap

Waste water discharge pipe (32 or 50 mm)

Rubber seal

32 mm pipe

Trapped water

Nasty odours from the sewer
Wash Basin Drain P-Trap

Dimensions in mm

Source: http://kitchenbathroomfixtures.com/sanliv-bathroom-sink-or-wash-basin-p-trap.html
Wash Basin Installation Dimensions

Dimensions in mm
Basin Mixer Dimensions

Single-trunk basin-mixer

Dimensions in mm

Source: http://www.plumbware.co.uk/product/mono-basin-mixer-tap/
Assembling the Bathtub

Various Bathroom fitments

Fig. 10.23 Bath
Fig. 10.24 Sitz bath
Fig. 10.25 Shower trays
Fig. 10.26 Installation of shower
Fig. 10.27 Hot and cold pipework

Source: F. Hall, Building Services and Equipment, Longman, 1992
Wall-mounted Bath Mixer Dimensions

Dimensions in mm

Kitchen Sink

Fig. 10.20 Stainless steel sink

Sizes
- Length  Width
  - 915 mm × 457 mm Single drainer
  - 1066 mm × 457 mm Single drainer
  - 1372 mm × 457 mm Double drainer
  - 1600 mm × 534 mm Double drainer

Source: F. Hall, Building Services and Equipment, Longman, 1992
Kitchen Sink
Water Closet

Dimensions L or H are taken into account during discharge pipe installation

Typical dimensions in mm
Soil and Waste Systems

The design of sanitary pipework systems:

A sanitary pipework system should contain the minimum amount of pipework necessary to carry away the foul water from the building quickly and quietly. It should not create a nuisance or risk to health, nor damage to the fabric, but it must prevent air from the drain or sewer from entering the building under all circumstances.

Traps and discharge pipes to sanitary appliances:

Every sanitary appliance should be fitted with a trap either as an integral part of the appliance or attached to and immediately beneath its outlet. All traps should be accessible and provided with adequate means of cleaning and for this purpose there is an advantage in providing traps which are capable of being readily removed or dismantled.
Soil and Waste Systems

The minimum internal diameters of traps to various appliances are as follows:

<table>
<thead>
<tr>
<th>Domestic Appliance</th>
<th>Minimum Installation dia.</th>
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</thead>
<tbody>
<tr>
<td>Wash Basin</td>
<td>32 mm (1 ¼”)</td>
</tr>
<tr>
<td>Bidet</td>
<td>32 mm (1 ¼”)</td>
</tr>
<tr>
<td>Sink</td>
<td>40 mm (1 ½”)</td>
</tr>
<tr>
<td>Bath/shower tray</td>
<td>40 mm (1 ½”)</td>
</tr>
<tr>
<td>Wash Tub</td>
<td>50 mm (2”)</td>
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</tbody>
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An air pocket forms between the water attempting to remain in the trap and the waste water flowing towards the stack. The static pressure of this air is below atmospheric pressure, and the water in the trap is pushed away from the trap, leaving an inadequate or non-existent seal. (also noise is created!) The problem is avoided by using 32 mm pipes only when the length is restricted to 1.70 m at a slope of 20 mm/m run.
The sloping waste-pipe can be up to 3 m long if its diameter is raised to 50 mm. This allows aeration from the stack along the top of the sloping section.
If the waste pipes are longer than 3 m with bends and even vertical parts, they are added a 25 mm open vent pipe as shown above.
Vent Pipes for Basins Remotely Located from the Stack

When the sanitary appliances can not be located close to the single stack system, then extra vertical vent pipes should be used. From these vertical vent pipes branches are connected to the end of the traps to ensure proper ventilation of the traps and protect the trap seal.

Source: Peter Burberry, Environment an Services, 8th Ed.1999, Longman
Washing Machine Connection

Source: https://www.pinterest.com/pin/265008759295445602/
Connection of Washing Appliances:
Connection of Washing Appliances:

- Washing machine
- Air gap
- Hose

- Ventilating pipe to atmosphere
- Washing machine hose
- Water-tight connection
WASTE WATER DRAINAGE

Basic Layouts

1. 1½" Waste Branches
   Washbasin
   Tub
   Toilet
   3" Soil Vent
   Sink
   Automatic Washer

2. Bath & Kitchen Back to Back
   1 TOILET 4
   1 BATHTUB 2
   1 WASH BASIN 1
   1 KITCHEN SINK 2
   1 AUTO WASHER 3
   7 FIXTURE UNITS

3. Bath with Kitchen Removed
   1 TOILET 4
   1 BATHTUB 2
   1 WASH BASIN 1
   1 KITCHEN SINK 2
   4 FIXTURE UNITS

Rough plumbing for a DWV system

How the Genova plumbing degree mark system works
Glossary

SOIL VENT PIPE  A vertical wide pipe into which toilet and other waste appliances discharge which is ventilated at its upper end to prevent syphonage.

INSPECTION CHAMBER  Another term for a manhole located over an underground drainage installation to allow access for cleaning and other maintenance.

DRAIN  Underground system of piping to discharge water and sewage away from the building.

WASTE PIPE  A pipe to carry water away from a basin, bath or sink.

GULLEY  A fitting of the underground surface water or waste water drain over which downpipes or other above ground drainage discharge. There are various types e.g. open gulley, back inlet gulley.