Welcome to

Whitecode Consulting

Foul and Surface Water Drainage CPD

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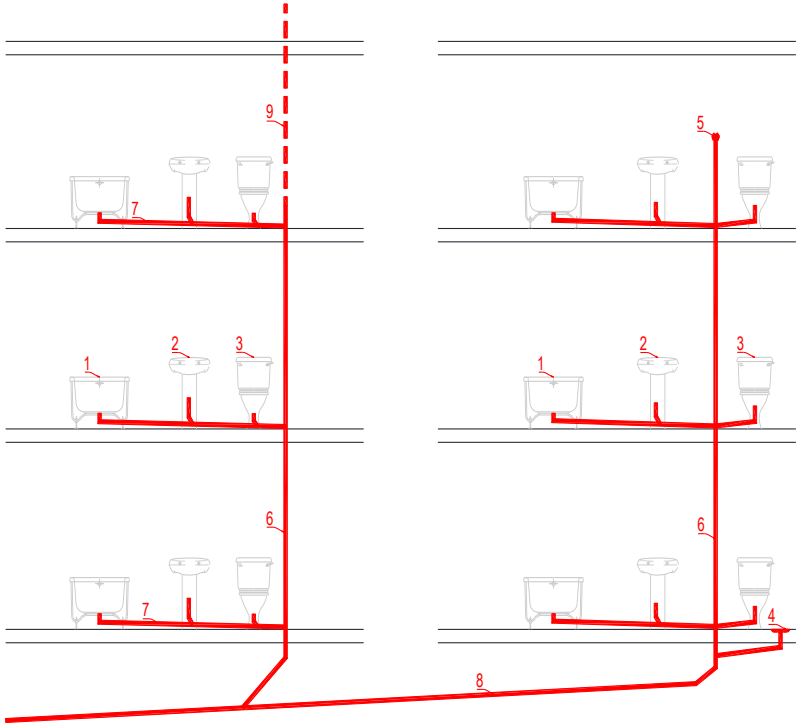
Foul Drainage

- Foul drainage within residential developments in the UK is designed in accordance with BS EN 12056 and is defined as system 3
- System 3 assumes 100% fill capacity with no AAVs or vents on branch pipes, which all connect to a discharge stack separately

Legend:

1 Bath
2 Wash Basin
3 WC
4 Floor Gully
5 Air admittance valve
6 Stack
7 Branch discharge pipe
8 Drain
9 Stack vent



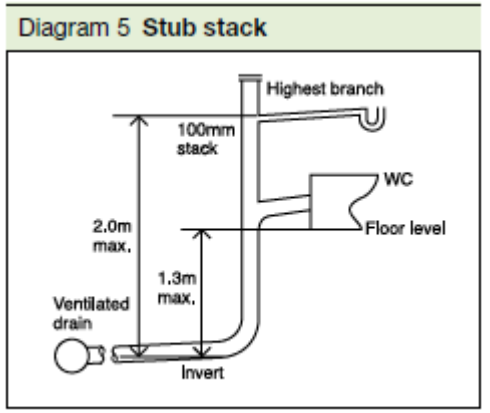
General Principles

- All stacks should be taken to atmosphere to avoid using Air Admittance Valves (AAVs):
  - Where required, SVPs should be offset and taken to the roof
  - AAVs should be avoided, as they require ongoing maintenance
- If stacks are not vented, when an appliance is flushed, a vacuum will be left behind as waste falls down the pipe. This vacuum will empty water from the traps of appliances, allowing sewer air into the property
- Stub stacks are required to comply with Part H:
  - Single storey stub stacks are required where an SVP rises more than 3 storeys
  - Double storey stub stacks are required where an SVP rises over 20 storeys
- Expansion is required to be taken into account and is to be provided at each level, in accordance with the manufacturers requirements

Durgo air admittance valve

The Durgo valve is designed to reduce the number of roof penetrations. Suitable for use in sanitary pipework systems up to ten storeys high, the valve must be fitted in a vertical position above the flood level of the highest appliance connecting to the stack.

Sub Stacks – Part H Compliant



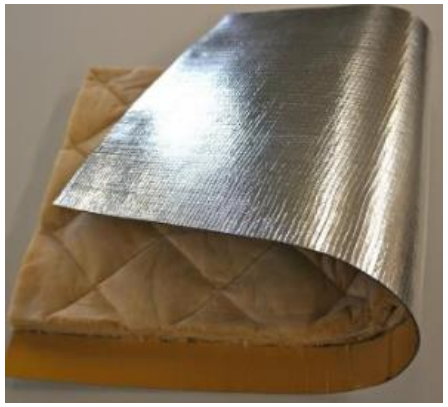
General Principles – continued.....

- All SVPs require fire-stopping using a fire collar when passing through vertical and horizontal fire-rated elements
- SVPs and RWPs should be insulated throughout their entire length, both vertically and horizontally, in order to prevent noise transfer:
  - Horizontally using SP25 Muftilag (or equivalent) - 30mm standard product
  - Vertically using 50mm mineral wool with 10kg/m^3 density
- Rubber-lined pipework supports should be used to prevent noise transferring into the structure at 0.9m intervals and 1.8m intervals in the horizontal and vertical respectively
- Where SVPs and RWPs offset horizontally, pipework should be installed as per this detail

Fitting Fire Stopping Collar

Hilti Fire Stopping Collar

SP25 Multilag



Rubber Lined Pipework Support

Pipework Materials

- Main discharge stacks should be fusion-welded High Density Polyethylene (HDPE)
- Branch discharge pipes should be PVC
- Discharges from HIU safety valves should be Polypropylene, due to the high temperature of fluid discharge
- Within commercial areas, HDPE should be used
- All basement distribution below 300mm should be installed in HDPE; anything larger than 300mm should be installed in cast iron

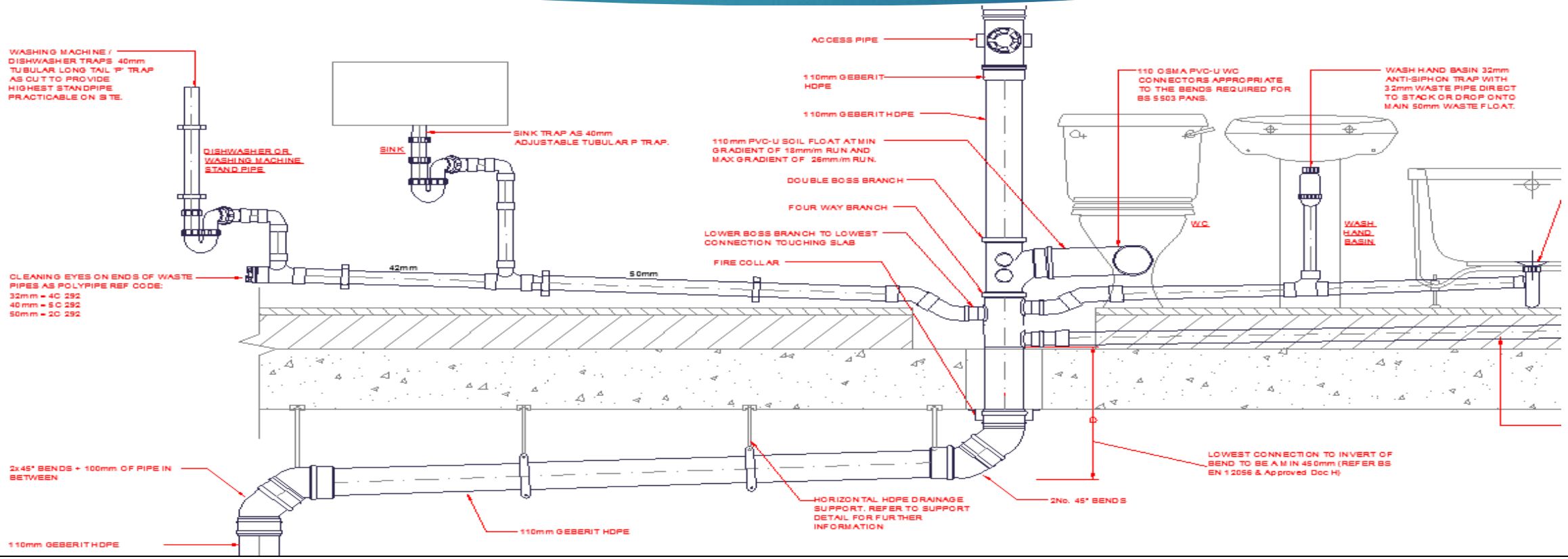
Geberit HDPE

PVC Branch Discharge Pipe

Cast iron Drainage

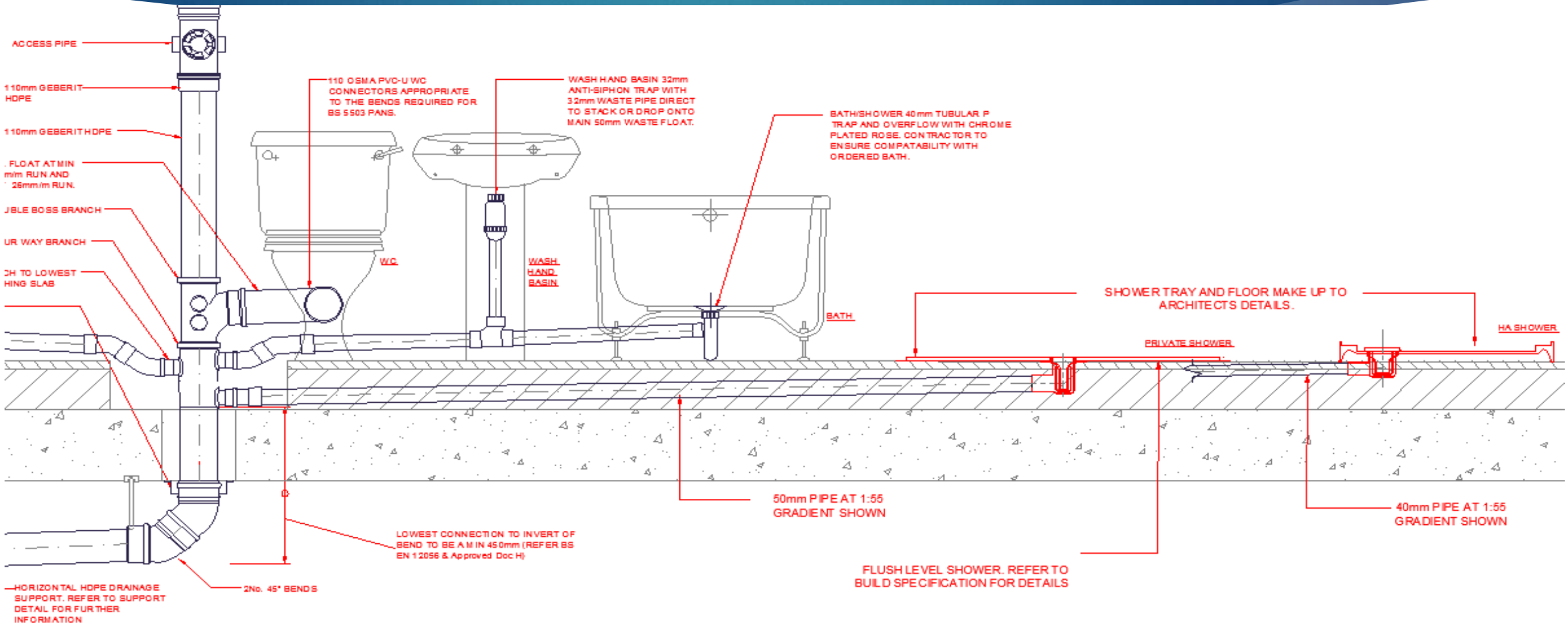
MEP HIU Cupboard

Pipework Materials – continued.....



This offset is representative of an apartment offset; where offset occurs in an accessible location (e.g. basement), rodding eye is to be provided at base of bend and on all changes of direction as well as at sufficient positions along main run to maintain entire system

Pipework Materials – continued.....



SVP Locations

Within apartments SVPs require positioning to take account of the maximum distances prescribed by BS EN 12056:2

BS EN 12056:2 places limitations on distance, size, gradient and maximum drop which must be considered when designing layouts

Distances can be increased through the use of anti-syphon traps and AAVs positioned on the branch pipe

Within commercial areas SVP layouts need consideration to maximise the flexibility of the unit in future

Appliance	Diameter DN	Min. Trap seal depth mm	Max. Length (L) of pipe from trap outlet to stack m	Pipe gradient %	Max. Number of bends No.	Max. drop (H) m
Washbasin, bidet (30 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	3,0
Shower, bath	40	50	No Limit	1,8 Min.	No Limit	No Limit
Bowl urinal	40	75	3,0	1,8 Min.	No Limit	3,0
Through urinal	50	75	3,0	1,8 Min.	No Limit	3,0
Slab urinal	60	50	3,0	1,8 Min.	No Limit	3,0
Kitchen sink(40mm diameter trap)	40	75	No Limit	1,8 Min.	No Limit	No Limit
Household dishwasher or washing machine	40	75	No Limit	1,8 Min.	No Limit	No Limit
WC with outlet up to 80mm	75	50	No Limit	1,8 Min.	No Limit	1,5
WC with outlet greater than 80mm	100	50	No Limit	1,8 Min.	No Limit	1,5
Food waste disposal	40 Min.	75	3,0	13,5 Min.	No Limit	3,0
Sanitary towel disposal unit	40 Min.	75	3,0	5,4 Min.	No Limit	3,0
Bath drain, floor drain	50	50	No Limit	1,8 Min.	No Limit	No Limit
Floor drain	70	50	No Limit	1,8 Min.	No Limit	No Limit`

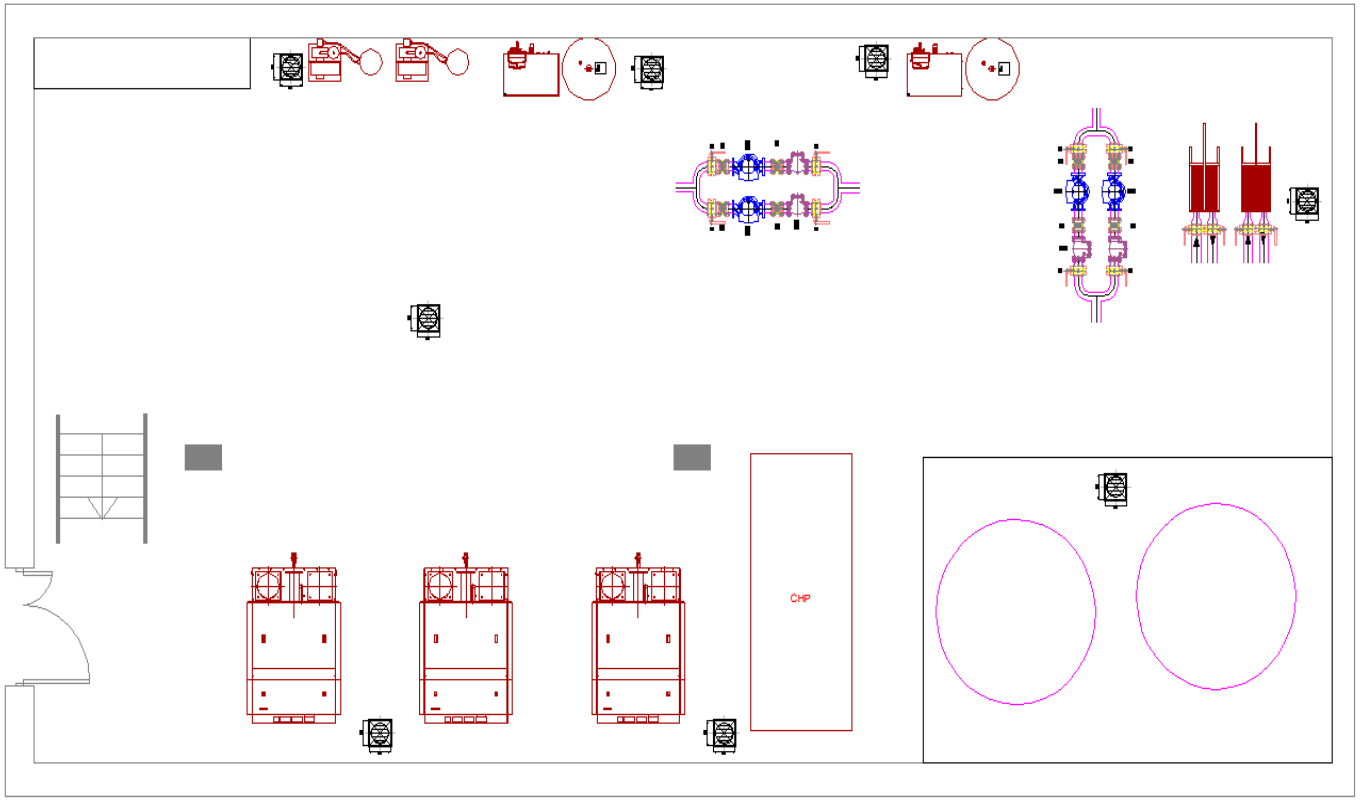
SVP Locations - continued.....

Floor drain	100	50	No Limit	1,8 Min.	No Limit	No Limit
5 basins	50	75	7,0	1,8 to 4,4		0
10 basins	50	75	10,0	1,8 to 4,4	No Limit	0
Bowl urinals	50	75	No Limit	1,8 Min	No Limit	No Limit
More than 8 WC's	100	50	No Limit	0,9 Min.	No Limit	No Limit
Up to 5 spray-tap basins	30 Max.	50	No Limit	1,8 to 4,4	No Limit	0

1) For maximum distant from trap to vent, see figure8.
2) If length is greater than 3m, noisy discharge may result with an increased risk of blockage.
3) Should be as short as possible to limit problems with deposition.
4) Sharp throated bends should be avoided.
5) For slab urinal for up to 7 pensions. Longer slabs to have more than one outlet.
6) Swept-entry branches serving WC's.
7) Included small potato-peeling machines.
8) Tubular not bottle or resealing traps.
9) See Figure 9.
10) Every basin shall be individually ventilated.
11) Any number.
12) Spray tap basins shall have flush-grated wastes without plugs.
13) The size of ventilating pipes to branches from appliances can be DN 25 but, if they are longer than 15m or contain more than five bends, a DN 30 pipe shall be used.
14) If the connection of the ventilating pipe is liable o blockage due to repeated splashing or submergence, it should be DN 50, up to 50mm above the spill-over level of the appliance.

Plant Room Drainage

- Trapped vari-level gullies should be provided at regular intervals for plant drainage, as well as general plant room maintenance
- Consideration of gulley positions is required to ensure there are no low level step overs
- This is also necessary in order to ensure plant bases are appropriately co-ordinated, to avoid the gulley



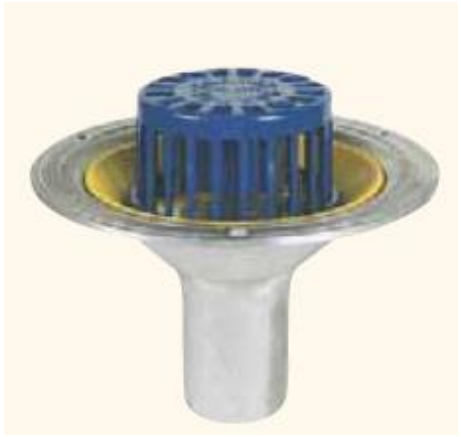
Access

- SVPs should have access doors at the following locations:
  - Kitchens – below worktop level
  - Bathrooms – 1200-1400mm generally
  - Elsewhere – 1200mm
- Access within bathrooms to SVPs should be via a mastic-jointed tile with dry-lined access panel behind to maintain acoustic properties and integrity of boxing
- Access within other areas should be via a dry-lined 300mm x 200mm access panel *(opposite)*
- Maintenance of offsets within dwellings is to be achieved by rodding access from the dwelling *(vertical portion)* above
- Maintenance of drainage within basement areas should be achieved by providing rodding access points at changes of directions and main runs, sufficient to rod the entire drainage network
- Sufficient and suitable access should be provided to enable all pipework to be tested and maintained effectively
- BS EN 12056 states “sufficient and suitable access should be provided to enable all pipework to be tested and maintained effectively”

Surface Water Drainage

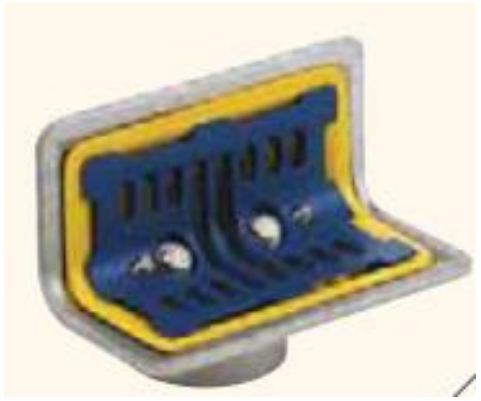
- All roof outlet flow rates should be given at a prescribed ‘head’; all rainwater outlets, when cast, must ensure the outlet is recessed sufficiently for water-proofing to be taken into the outlet, in order to avoid creating a high point
- Depending on the outlet type, bends within the slab may occur. It may be necessary for the contractor to purchase*(NHBC requirement)*
- a prefabricated bend, in order to ensure no joints are within the slab Gullies should be positioned at low points in the slab to avoid ponding, in accordance with NHBC guidance

Surface Water Drainage



100mm Vertical Outlet

10.7l/s, high flow characteristics, which should be used where possible to minimise roof penetrations and downpipes



100mm Parapet Outlet

2.05l/s, low flow characteristics, typically used where RWPs run externally, or where it is not possible to run an RWP vertically

100mm 90^0 Outlet

4.5l/s, also useful for SVPs running to external or within cladding zones, with better flow characteristics than the parapet outlets

Podium Landscaped Drainage

- A drainage layer should be provided to enable sub-surface water to discharge to rainwater outlets
- Permeable areas should be able to discharge to the drainage mat without any need for positive drainage
  - A geotextile filter membrane (or equivalent) is required to prevent silt accumulating within the drainage mat
- Hard-landscaping should be positively drained in order to prevent ponding, which should discharge to the podium drainage mat via a silt trap; alternatively, this can be discharged directly to the drain, subject to the project requirements
- Any outlets provided in landscaped areas should be provided with access chambers to enable cleaning

Other Considerations

- Rainwater harvesting should be designed on each project, subject to BREEAM/CfSH/Planning obligations
- Attenuation requirements on each job require a collaborative design between the M&E Consultant and the Civil Engineer
- Flood risk assessments may inform the requirements of attenuation strategy on the scheme and, therefore, need to be given due consideration
- Systems should be subject to regular maintenance to ensure outlets are not blocked, drainage mats are not silted up and overflows are clear of debris
- Petrol interceptors will usually be required to car park areas and will be confirmed by the Civil Engineer in conjunction with the local water authority

Thank you for listening

Any Questions?