

General Notes:

Above Ground and Below Ground Drainage

The builder is to investigate the arrangement of the existing foul and surface water systems during the tender period and during construction on-site, including; but not limited invert levels. The builder to bring to the attention of the CA any issues which may impact on the design details to prevent successful drainage discharge. The design details show the intention to discharge the drainage in a successful manner. It is the responsibility of the builder to ensure successful discharge considering practicalities on-site prior to and during construction. Drainage is to be laid to fall in direction of flow. Drainage is to be undertaken in full and strict accordance with manufacturer's details, Building Regulations, British Standards, and all other codes of practice.

Above Ground Drainage

The above ground drainage system is to be undertaken using solvent weld pipe work by 'Marley Plumbing and Drainage Solutions Limited' or similar and equally approved. The above ground drainage system is to be undertaken in full and strict accordance with the manufactures details, Building Regulations, British Standards, and all other codes of practice. The above ground drainage system is to be to the complete satisfaction of the Local Building Control Officer whether or not indicated in the contract documents.

Wastes complete with 75mm deep seal anti-vacuum traps and meet the following criteria:

Waste Sizes:			
- 32mm Ø	Wash Hand Basins	Max length - 1.7m	Gradient 18 to 22
- 40mm Ø	Sinks	Max length - 3m	Gradient 18 to 44
- 100mm Ø	W.C's.	Max length - 15m	Gradient 18 to 90

Branch Pipes

- Branch pipes should discharge into another branch pipe, discharge stack, or stub stack unless discharging directly into a gully.

- Opposed branch connections on a 100mmØ discharge stack should be offset at least 110mm and 250mm on a 150mmØ discharge stack. Opposed connections larger than 65mm should be offset at least 200mm irrespective of the discharge stack diameter. Unopposed connections may be at any position.

- The lowest branch connection should not discharge within 450mm of the drains invert at the foot of the discharge stack.

- Bends in branch pipes should be avoided, however, where this cannot be achieved the should have a large radius.

Discharge Stacks

- All stacks should discharge to a drain in accordance with the drainage engineers details. The rest bend at the foot of the discharge stack should be should be at least 200mm at the centre line.

- Stub stacks may be used if it connects onto a ventilated discharge stack and where a branch pipe does not exceed more than 2m from the invert. Stub stacks should be fitted with an air admittance valve in accordance with BS EN 1280:2002. Stub stacks enclosed in boxing should be ventilated in accordance with manufactures details. Where manufactures guidance is absent ventilation should provide a free area of 2500mm². Air admittance valves positioned on the above ground drainage system to prevent induced siphonage as manufactures guidance.

- Discharge stacks should terminate to outside air to maintain water seal, and terminate 900mm above any opening within 3m. Discharge stacks to be fitted with a cowl. Suitably flash where ventilating stack penetrate the roof covering. All in full and strict accordance with roof manufactures details

- Rodding / access points should be provided in the discharge stacks and at appropriate locations on the above ground drainage system i.e. change of direction, start of pipe runs, and base of discharge stacks. sighted above the spillover level of the appliances These should at accessible positions for maintenance purposes.

Building Works

- Silicone seal around all fitments and associated junctions using 'DOW Corner Sealants' or similar and equally approved in white. including but not limited to vanity units, sink units, wash hand basins, wash troughs, cleaners sinks, W.C pans, and tiling junctions etc.

- All exposed pipe work shall be boxed in. Boxing to be constructed using softwood timber frame clad in 9mm plywood or white rock for wet areas. Pipe work to be wrapped in at least 25mm Knauf Earthwool Flexi. Insulation is to be neatly encased around the pipe work and be tight butt jointed to maintain acoustic performance. Tie wrap the insulation where necessary to keep wrapping in position. Boxing's complete with accessible panels including but not limited to rodding points etc, to ensure ease of maintenance.

- Pipe work should be suspended from the structural soffit when running in ceiling or floor voids. Suspend using 'Marley pipework support system' or similar and equally approved. Fit pipe work in intermediate support brackets attached to 8mm drop rods at centres detailed in table:

	Pipework Diameter			
	32mm	40mm	50mm	110mm
Horizontal	0.5m	0.5m	0.5m	0.9m
	1.2m	1.2m	1.2m	1.8m

Include for all materials, fixtures, and fittings to ensure successful installation on-site. All above ground drainage is to be installed in accordance with the chosen fitments. The cubicle manufactures working drawings are to be approved by the CA prior to commencement of works on-site.

Testing & Inspections

Inspection and testing should be undertaken during the installation of the above ground system to ensure that pipe work is properly secured and clear of obstruction, debris, and superfluous matter.

On completion the system must be inspected to ensure that not cement droppings, rubble etc are left on the pipe. When is complete tests for soundness of pipe work and performance should be made.

Air test should be undertaken to ensure that the installation is capable of withstanding an air test positive pressure of at least 38mm water gauge for at least 3 minutes. During this time the traps should maintain a water seal of at least 25mm.

Drainage Notes Continued

Underground Drainage

100mm Ø underground 'Osma' uPVC (push fit) pipe work in accordance with BSEN1401+. Pipe work to be bed and surround in at least 100mm pea gravel with at least 300mm of granular fill above the crown or vitrified clay ware in accordance with BS65 BS EN 295+ bed and surround in at least 150mm pea gravel with at least 150mm of granular fill above the crown as per Diagram 10. Pipe work is to be laid to fall 1in 60 and to connect into on-site foul and surface water system as appropriate at the invert of the existing suitably benched where necessary.

Drains are to be lintelled over where walls cross with rocker pipes within 150mm either side (600mm max length). Lintels to be in accordance with manufacturer's details. Generally 100mm Naylor's should suffice. Drains passing through mass fill foundations should be suitably bridged (e.g. sleeve the pipe or form a plywood box over the pipe). A 50mm space around the pipe flexibly sealed to prevent the ingress of fines or vermin. It may be necessary for the builder to appoint a Structural Engineer to justify excessively spanned concrete bridging lintels if requested by the building control officer on-site.

Where drains are lower than foundations within 1m, bed and surround in concrete up to the lowest level of the foundations. Movement joints with flexible boarding at joints. A 45° line should be taken to determine the depth of the foundations where greater than 1m.

Where uPVC pipe work / vitrified clay ware is shallower than that described in table 8 & 10 the pipes where necessary should be protected from damage by a reinforced concrete slab, with flexible filler, and at least 75mm granular material to bed and surround the pipe as per diagram 11.

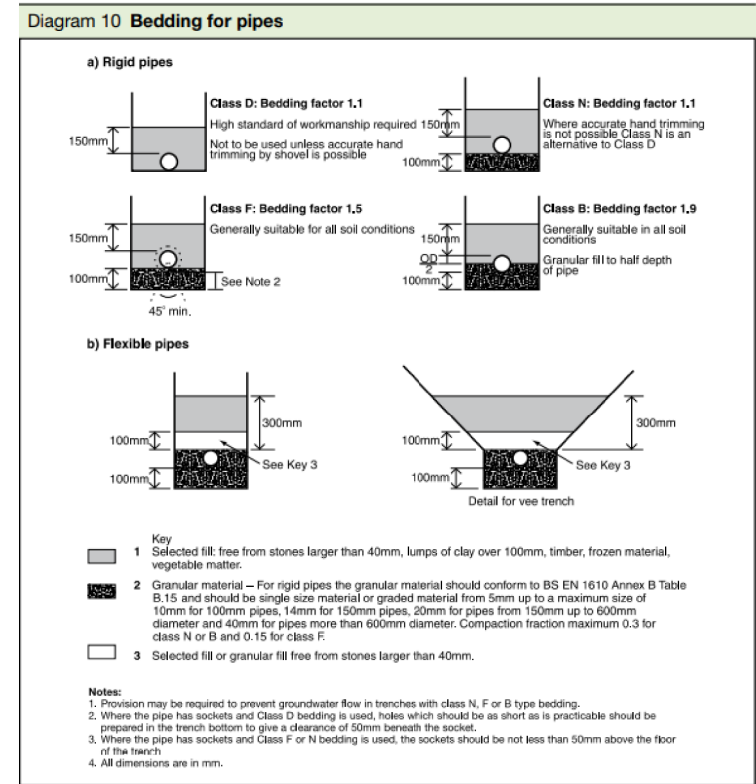


Table 10 Limits of cover for thermoplastics (nominal ring stiffness SN4) pipes in any width of trench			
Nominal size	Laid in fields	Laid in light roads	Laid in main roads
100mm – 300mm	0.6m – 7m	0.9m – 7m	0.9m – 7m
Notes: 1. For drains and sewers less than 1.5m deep and there is a risk of excavation adjacent to the drain and depth, special calculation is necessary, see BS EN 1295. 2. All pipes assumed to be to in accordance with the relevant standard listed in Table 7 with nominal ring stiffness SN4; other strengths and sizes of pipe are available, consult manufacturers. 3. Bedding assumed to be Class S2 with 80% compaction and average soil conditions. 4. Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295. 5. Minimum depth is set to 1.5m irrespective of pipe strength to cover loss of side support from parallel excavations.			

Table 8 Limits of cover for class 120 clayware pipes in any width of trench			
Nominal size	Laid in fields	Laid in light roads	Laid in main roads
100mm	0.6m – 8+m	1.2m – 8+m	1.2m – 8m
225mm	0.6m – 5m	1.2m – 5m	1.2m – 4.5m
400mm	0.6m – 4.5m	1.2m – 4.5m	1.2m – 4m
600mm	0.6m – 4.5m	1.2m – 4.5m	1.2m – 4m
Notes: 1. All pipes assumed to be Class 120 to BS EN 295; other strengths and sizes of pipe are available, consult manufacturers. 2. Bedding assumed to be Class B with bedding factor of 1.5; guidance is available on use of higher bedding factors with clayware pipes. 3. Alternative designs using different pipe strengths and/or bedding types may offer more appropriate or economic options using the procedures set out in BS EN 1295. 4. Minimum depth in roads set to 1.2m irrespective of pipe strength.			

Provide manholes and inspection chambers at every change of direction, change of pipe size, and at connections with Class B cast iron cover.

225mm Ø uPVC access fitting up to 0.6m deep for pipe work less than 150mmØ with access reduced to 350mm for greater depths

450mm Ø uPVC inspection chamber up to 1.2m deep for pipe work less than 150mmØ with access reduced to 350mm for greater depths

1000mm ØPrecast Concrete (PCC) manhole up to 1.5m deep for pipe work less than 150mmØ, and 1200mm Ø PCC manhole greater than 1500mm deep for pipe work less than 225mm Ø. All PCC manholes as manufacturer's details on 225mm Gen1 concrete base haunched around pipework. Maximum spacing between manholes of 45m. Manholes deeper than 1m should have step irons or a fixed ladder.

Provide rainwater channels by 'Aco' or similar and equally approved at least at all level access thresholds. Aco channels with concrete bed and haunch surround laid to fall to outlets. Aco channels to connect onto the SW system.

Surface water is to discharge in order of priority: A) soak away at least 5m from any building or boundary B) surface water system or C) combined system as per agreed with the Building Control Officer during construction.

General Notes:

- Allow for all materials, fixtures, and fittings, and all other builders work to complete the installation; including but not limited to; excavation and backfill.

- All excavations are to be backfilled to match the existing

- Appropriately support trench sides greater than 1.2m deep.

- Keep trench widths as narrow as possible but not less than 300mm wider than the pipe diameter i.e. 150mm either side to allow proper compaction at side fill.

- As dug materials may be backfilled in 225mm layers mechanically tampered

-Remove or cap off any redundant drainage with concrete.

-Upvc / clay ware adaptors where necessary

- Insulate internal discharge stack boxing's for sound with at least 25mm Rockwool or Knauf Earthwool flexi

- All to be installed in full and strict accordance with manufacturers details.

- Builder is to assess the drainage proposal prior to commencement of works (during the tender period) and raise any issues with the CA at that time should the design proposal seem impractical for builder during construction on-site.

- All pipe work is to be laid in the direction of flow. Builder to check all invert levels prior to construction on-site to ensure successful drainage discharge.

