BUILD RIGHT

Pipes under slabs

The location of sewer and stormwater pipes requires careful planning at the design stage of a building project as changes are difficult and costly to achieve once a floor slab is in place.

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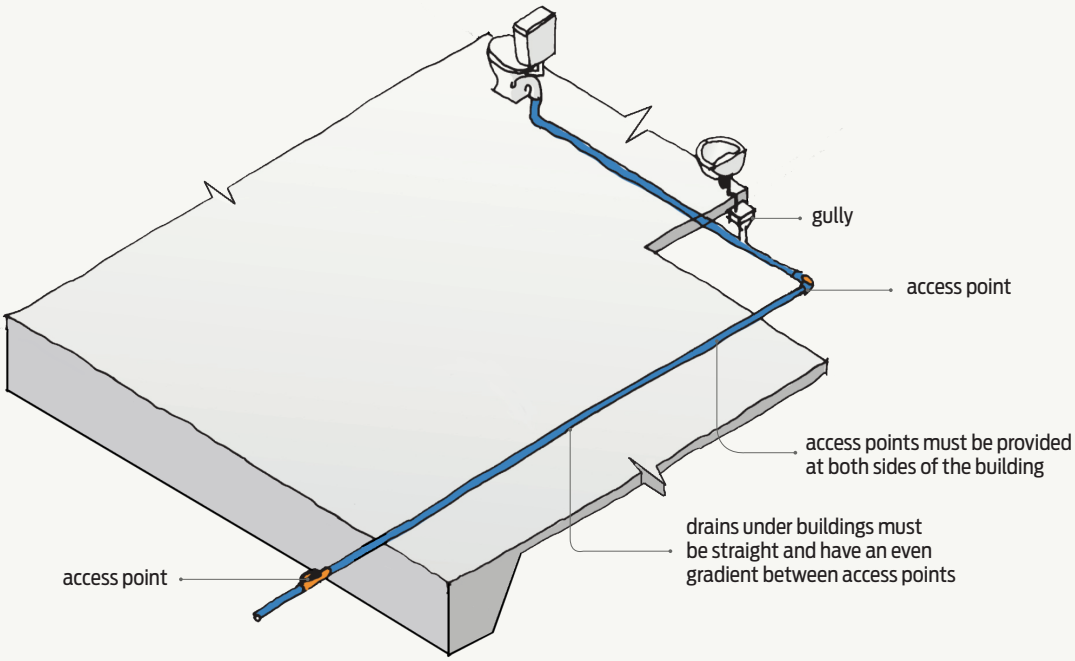

Figure 1 **Drainage pipes under concrete slab.**

SEWER AND STORMWATER PIPES may sometimes need to go through and below concrete floor slabs and footings.

Several relevant Building Code clauses

All pipework in and below a concrete floor slab must comply with New Zealand Building Code clause B2 *Durability*, which requires that they have a minimum durability of 50 years. Verification Method B2/VM1 describes in-service history, laboratory testing and compatible performance of similar building elements as means of establishing durability.

Sewer pipes must also comply with Building Code clause G13 *Foul water*, which requires that buildings with sanitary fixtures and appliances have an appropriate drainage system to remove foulwater.

Acceptable Solution G13/AS2 *Drainage* and AS/NZS 3500 *Plumbing and drainage* both provide means of compliance with clause G13. Both allow the installation of drainage pipes under buildings, although G13/AS2 is limited to buildings that are no more than 3 storeys. Specialised sanitary systems such as for factories or hospitals are not included.

Pipes under concrete slabs

Pipes under a concrete slab complying with G13/AS2 must:

- be laid straight and with an even gradient (see Figure 1)
- be separated from the building foundation by at least 25 mm.

The clearance between the top of the pipe and the underside of the slab (see Figure 2) varies:

- G13/AS2 requires a minimum 50 mm.
- AS/NZS 3500 requires a minimum 25 mm.

AS/NZS 3500 also requires that, where a drain passes under a strip footing, the angle of inter-

section with the footing must not be less than 45º (see Figure 3).

Both G13/AS2 and AS/NZS 3500 require that pipes passing through a concrete slab (see Figure 4) must:

- rise through the slab at right angles
- be sleeved or wrapped in a durable, flexible material.

The exposed pipe above the slab should be protected from damage and be capped before the concrete is placed.

Junctions and access points

Where a pipe junction occurs beneath a slab, the angle at the junction must be no more than 45º.

Drains must be laid to allow easy access for maintenance and clearing blockages, with access points provided immediately outside the building.

If two or more soil fixtures are connected to a branch drain beneath a slab, an access point must be provided downstream of the highest fixture connection. Where the access point is within the building, it may be a sealed, floor-level rodding point. This must comply with the isolation and ventilation requirements for the spaces in which the soil fixtures are located.

Lay in trenches

Drainage pipes, including those under slabs, must be laid in trenches with a minimum width of the diameter of the pipe plus 200 mm – 100 mm on either side of the pipe.

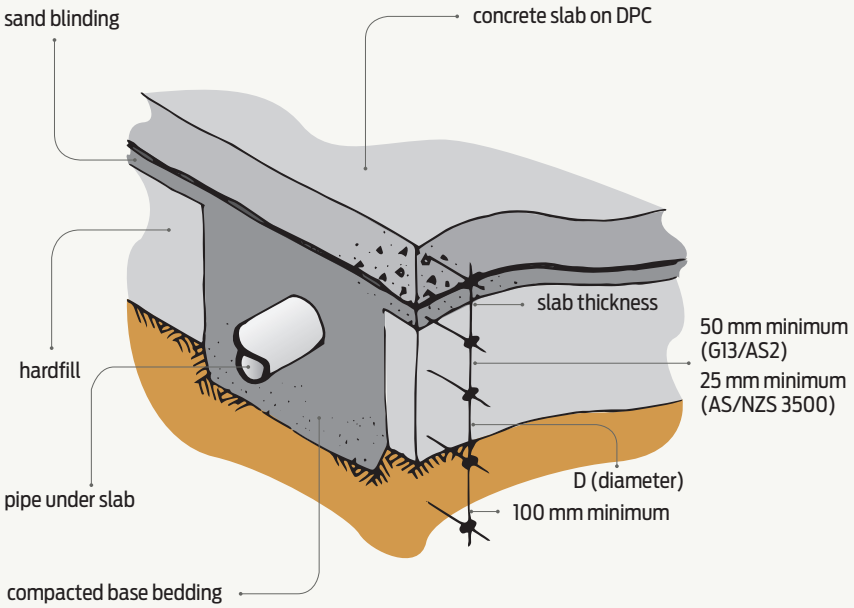

Figure 2 **Clearance between pipe and slab.**

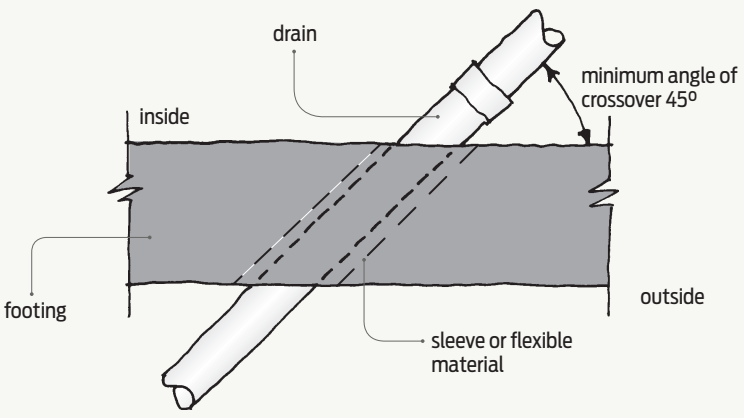

Figure 3 **Pipe passing through a footing (plan view).**

Figure 4 **Sleeved drainage pipes.**

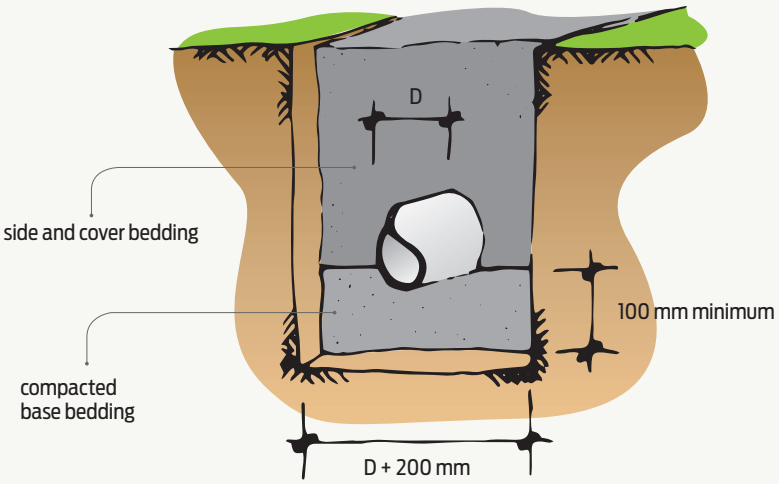

Figure 5 **Trench bedding and backfilling outside slab area.**

The pipe must be on a minimum 100 mm compacted base bedding of sand or other granular material with a maximum particle size of 20 mm. Compacted side and cover bedding is needed. The cover bedding depth varies according to the depth of the trench (see Figure 5).

Sleeve pipes through foundation walls

Drainage pipes passing through a foundation wall must be sleeved with a minimum 25 mm clearance and filled with a flexible material so they can move independently of the slab or beam.

The pipe should be located in the middle third of the beam both horizontally and vertically (see Figure 6).

Channels in slabs

Instead of being installed under the building in commercial or industrial buildings, pipes may be installed in channels in the basement slab. This allows for easy access for maintenance.

Where a channel is created in a concrete slab, the slab thickness below the channel must be increased by the same depth as the channel to maintain the same depth of concrete.

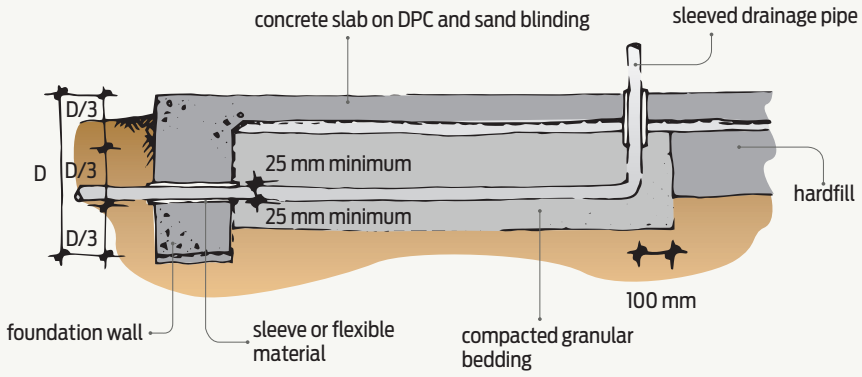

Figure 6 **Drainage pipe through foundation beam.**