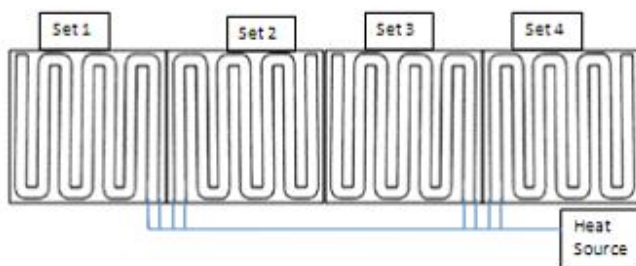


UNDERFLOOR HEATING INSTALLATION NOTES:

Attached find information for Ginde's heating pipeline design for underfloor heating.

The maximum heat output for underfloor heating systems are 100 W/m² for concrete floors and 70 W/m² for timber suspended floors. For any underfloor heating system to work efficiently the property needs to be built to current building regulations. See underfloor pipe and temperature rating file attached. Carpet and underlay should not exceed 2.5 Tog. The pipe will be laid with centers at 200-300mm.

The pipe length should increase depending on the heat output required which depends on the water flow temperature, the room temperature and the centre distance required.



The maximum loop length should be 100 m, this is mainly dependable on the size of pump (head pressure) used in the installations as well as flow temperature. This will be 16mm multi layer pipe. You would see there are more than one set of loops because of the 100m length, 200m length pipe is also available, but not recommended. The feeding pipe from the heat source needs to be larger size (32mm) due to the flow required to the different sets. The feeding pipe size will depend on the amount of sets used.

The pipe will be embedded in a thick concrete foundation slab or in a thin layer of concrete, gypsum, or other material installed on top of a subfloor. If concrete is used and the new floor is not on solid earth, additional floor support may be necessary because of the added weight. You should consult a professional engineer to determine the floor's carrying capacity.

Thick concrete slab systems have high heat capacity and are ideal for storing heat from solar energy systems, which have a fluctuating heat output. The downside of the thick slabs is their slow thermal response time, which makes strategies such as night or daytime setbacks difficult if not impossible. Most experts recommend maintaining a constant temperature in homes with these heating systems.

The most popular method of installation is as follows:

A concrete slab (or suspended beam and block construction) is laid over a damp proof membrane. A 20mm thick piece of insulation is fixed to the perimeter (external) walls, to a height to include the depth of floor insulation and screed.

Whilst the edging insulation may be on show it is covered by wall plastering and skirting boards.

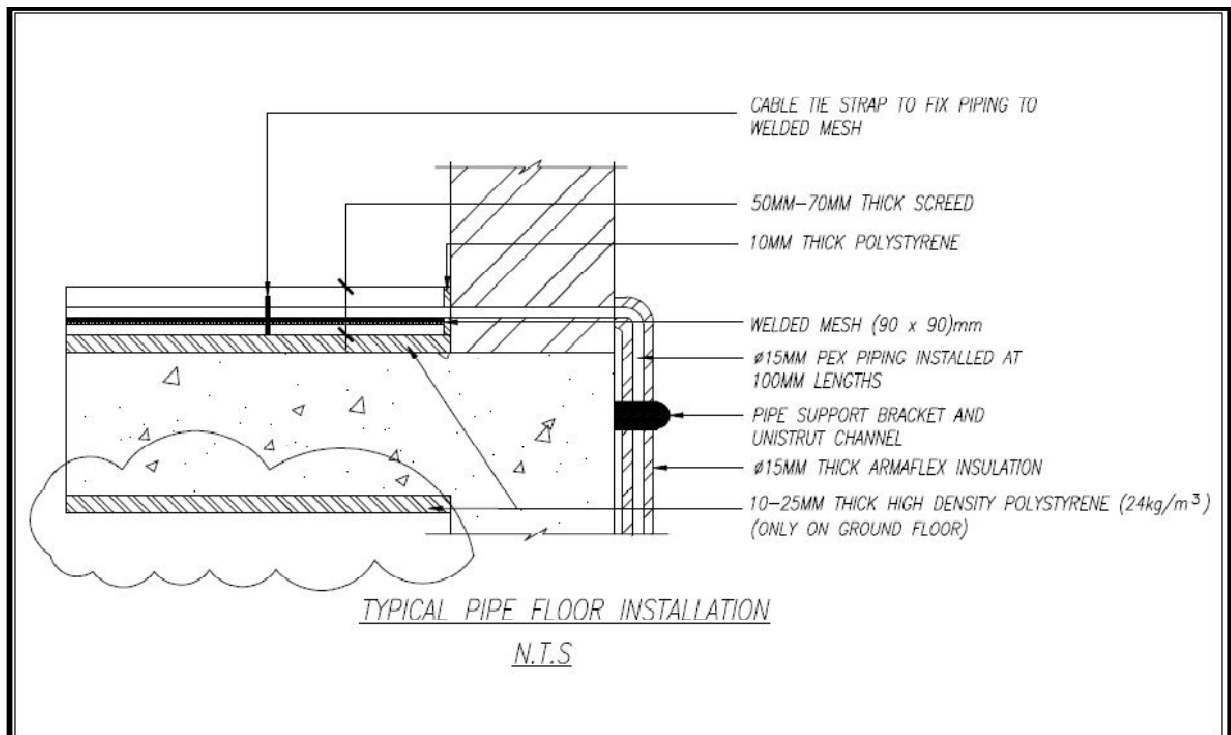
Floor insulation is laid to the whole area, joints are taped to prevent the ingress of screed between the insulation boards. The floor is now ready for the underfloor heating pipework installation.

We recommend you use a 50mm layer of Polyurethane insulation. If there is not enough space for 50mm insulation, 30mm is recommended. We recommend Polyurethane as it out performs Polystyrene and its greater density allows use of clip fittings. Polystyrene used should be 20-24kg/m³ density with thickness 25-50mm. If you use polystyrene insulation it is recommended that you install wire mesh on top of the insulation and tie the pipe to the mesh.

Finally 50 - 75 mm screed is laid on top of the insulation and the pipe. The screed must be allowed to dry for a minimum of 4 to 6 weeks before the heating is operated. As the system is used for the first time, the mixing valve must be set to minimum setting to let the moisture in the screed to dry out. The temperature should be increased by two degrees every day until the mixing valve is set at 45°C.

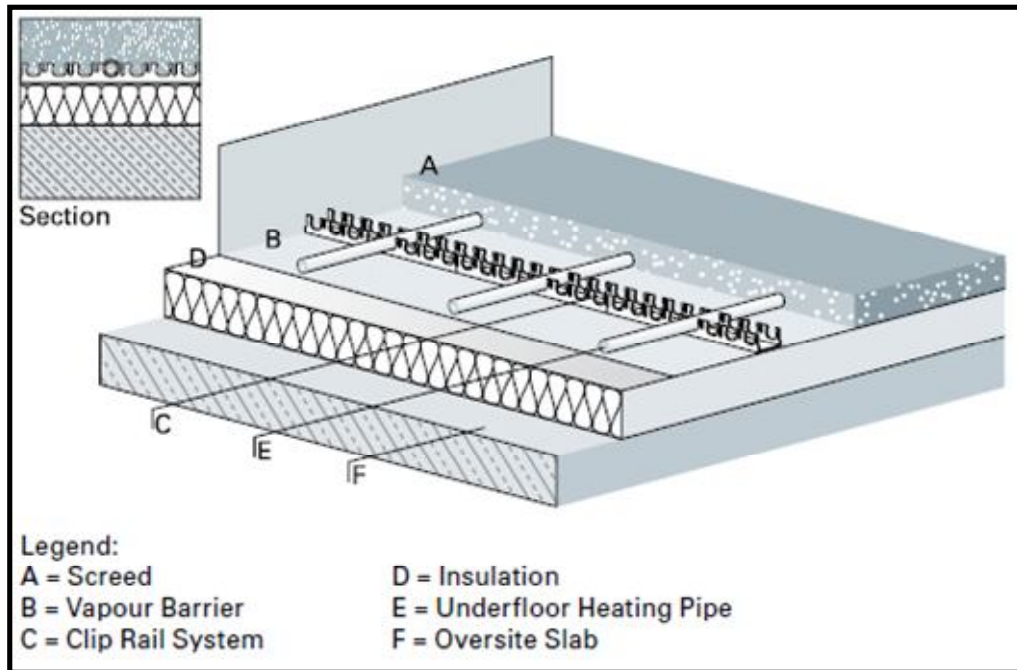
If floorboards were used, these boards must have moisture content lower than 7 % before they are installed. We do not recommend floorboards thicker than 25 mm. Always check with the manufacturers of any floor finish that it will work with underfloor heating. For stone and ceramics tiles it is recommended that flexible adhesives and grout are used. Avoid underlays for carpet with felt and rubber crumb type. With Vinyl check the vinyl floor manufacturer that it works with underfloor heating. Laminate flooring should have an expansion gap for movement. As WC and Bathrooms are very small areas, extra heat might be needed. Therefore it is standard practice to install towel rails in these areas, combined with the underfloor heating.

See typical floor installation

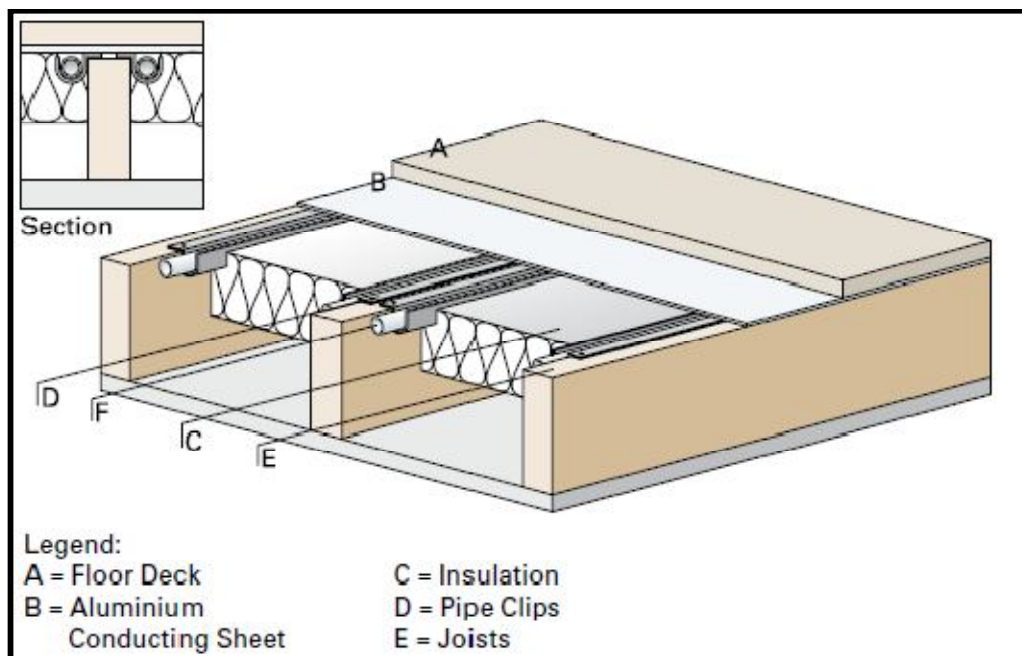


See also different types of floor installations:

1. Screed / Solid floor system



2. Suspended floor system



3. Floating floor system

