

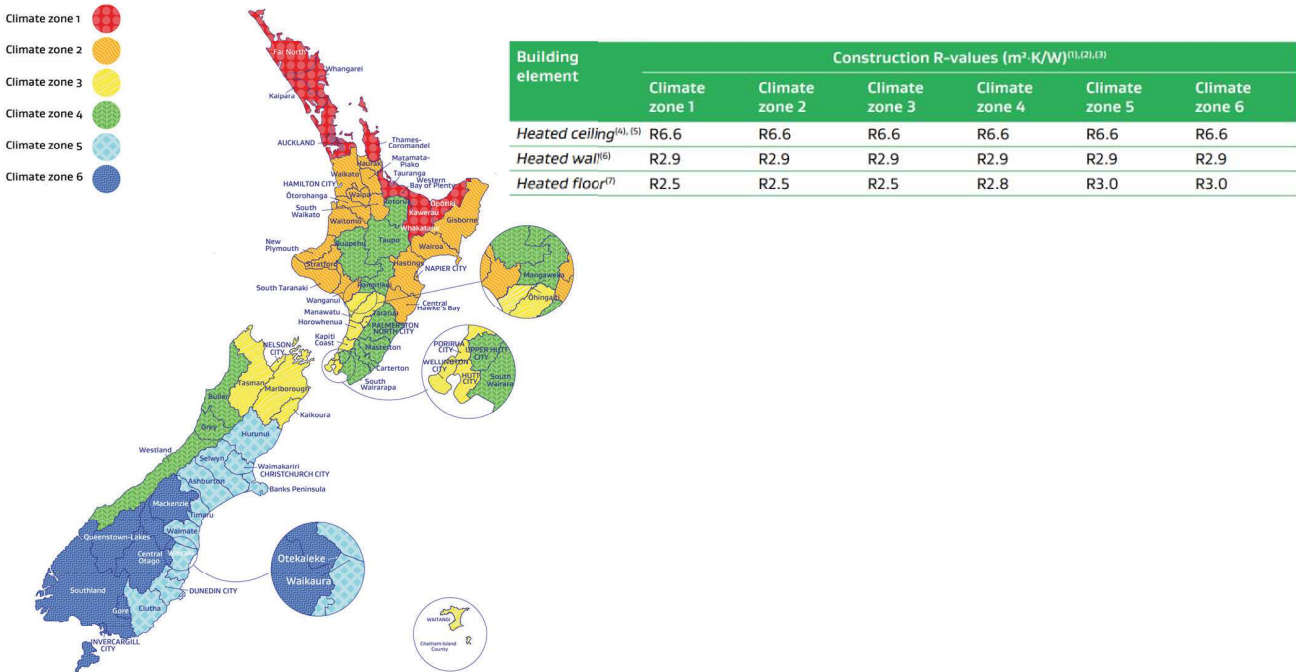
NOTE: Floor losses

NZ Building Code requires an appropriate thermal insulation in new construction to ensure a minimum R-value of R2.5-R3.0 depending on NZ climate zone when concrete slab is heated.

The amount of insulation needed requires the simple calculation of Building Footprint "Perimeter divided by Area" and displayed in the form of a ratio P/A. The use of this ratio will enable the Architect, builder or owner to determine the correct thickness and type of insulation.

Think of the floor as the heat emitter: when the heating is "on", it will always be warmer than the room temperature; however, any downward flow of heat should not be included in the heat loss calculation for sizing floor coils.

Floor losses will need to be included only when sizing the boiler, or other heat source, and distribution pipework, but not included in sizing the heat emitter. The maximum downward losses should be limited by the effective installation of floor slab and the use of perimeter edge insulation.



High ceilings

As UFH does not produce the same convective gradients as radiator heating, the additional factor for rooms with high ceilings can be ignored.

Building types and room types should be given special consideration when designing an underfloor heating system

The following must be taken into consideration by the designer:

- Older buildings
- Buildings heated by a heat pump
- Small rooms with two or three outside walls
- Corner bathrooms
- Corridors with large glass areas

Module 3 Floor Systems and Finishes

There are four main types of floor construction applicable to UFH systems:

- Solid floor
- Screed floor
- Timber/intermediate floor
- Floating floor

Solid/screed floors (single/two pour)

These types of floor rely on the conductivity of the screed or concrete to conduct heat from the pipe surface to the underside of the floor finish

Typical construction includes:

- Floor finish
- Solid or Screed conducting layer
- Edge insulation
- Floor insulation

Solid floor (single pour)

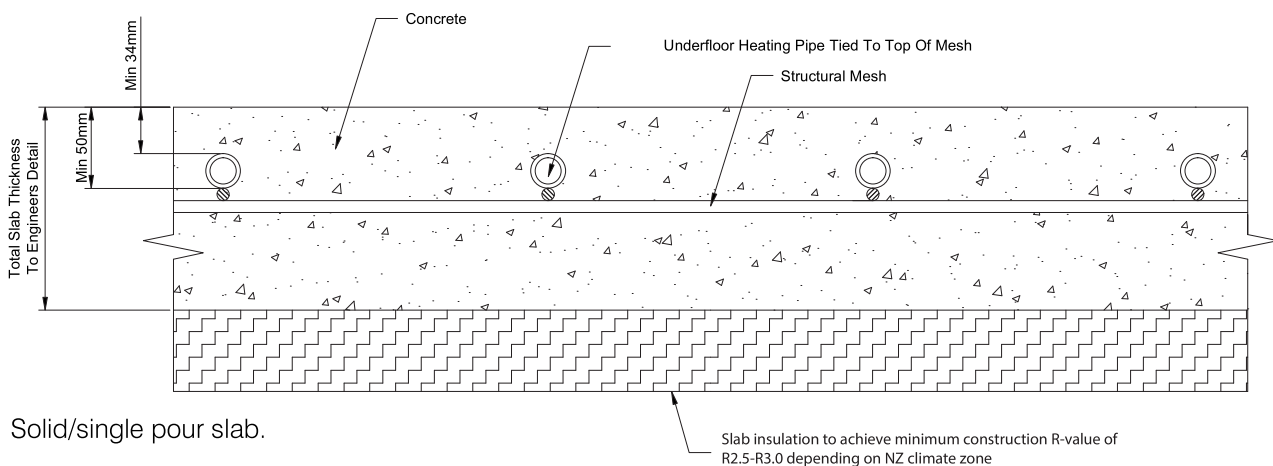
The solid or single pour floor consists of a insulation layer of at least 50mm to comply with NZBC Clause H1, mesh support chairs or top hats to which the structural rebar mesh is fixed to.

UFH pipework is then fixed to the mesh and the concrete is then pour to a minimum of 100mm ensuring there is coverage above the UFH pipework typically between 30 to 50mm.. Having the pipework within the pour ensures that the pipes are completely encased in the concrete which will maximize the output potential of the system.

Due to the nature of some construction methods awareness of possible concrete cuts do need to be noted, this may require the UFH pipes to be fixed lower in the area of the cuts, or additional mesh used lower in the slab to fix the pipes to to protect from the cuts.

The use of crack inducers removes the issue of cuts in most cases. Moving to a screed or two pour systems removes the issue completely but is not as widely used in New Zealand at the present time.

All concrete (single pour) systems should be allowed to cure and dry naturally until full strength is achieved, which usually takes 28 days. Heat commissioning should not be carried out for at least 28 days after the laying of all concrete and screeded systems. The UFH system must not be used to speed up the curing time of the concrete slab.



Solid/single pour slab.