Adding a home extension with tight garden access? Here's how mini piling works

Why access matters for foundation work

When you plan a home extension, the foundation is one of the first things to sort out. For a straightforward extension on open ground, a standard strip or trench fill foundation is usually fine. But many UK homes sit on plots with narrow side access, a small back garden, or a rear boundary shared with a neighbouring property. In those cases, getting a conventional digger or mixer into the space becomes difficult or impossible. That is where a smaller, more targeted approach to foundation work comes in: domestic mini piling.

Domestic mini piling uses a compact rig that can pass through a standard garden gate or a narrow passage at the side of a house. The rig drills steel-reinforced concrete piles into the ground, transferring the weight of your extension down to a stable load-bearing layer. Once the piles are in, a ground beam ties them together and supports the new walls above. This article walks through the sequence of steps involved, from initial ground assessment to finishing the capped piles, and highlights what to watch at each stage.

1. Assessing the ground conditions and access route

Before any piling rig arrives, a site assessment is needed. A structural engineer or a ground investigation specialist will check what lies beneath your garden: the soil type, the depth of any soft topsoil, and the position of the water table. They also look at the condition of existing foundations on your own house and any nearby structures. This information tells the piling designer how deep the piles must go to reach competent ground.

At the same time, measure the access route from the street to the build area. Note the width of any gate, the height of any overhanging branches, and any tight corners. A standard mini piling rig is usually less than a metre wide, but you still need a clear path. If there is a step or a kerb, the rig may need a temporary ramp. The site survey should record all these dimensions so the piling contractor can confirm that their equipment can get in and work safely.

What to watch

Do not assume that a narrow side access automatically means mini piling is the only option. Sometimes a small tracked excavator can still dig a trench if the access is just wide enough. The choice depends on the soil conditions and the structural design of your extension. A good ground investigation report will give you the facts you need to decide.

Also, check for buried services: water pipes, gas lines, electric cables, and drainage runs. Your local utility records or a private survey can show where these lie. Piling through a live service is dangerous and costly, so mark them clearly before any drilling starts.



2. Designing the pile layout and ground beam

Once the ground conditions are known, the structural engineer designs the pile layout. For a typical domestic extension, piles are placed at regular intervals along the line of the new walls. The number and depth of piles depend on the weight of the extension and the bearing capacity of the soil. The engineer also specifies the diameter of each pile, the amount of reinforcement steel inside it, and the concrete mix strength.

The piles themselves do not carry the walls directly. Instead, a reinforced concrete ground beam sits on top of the piles and spans between them. The beam distributes the load evenly and provides a level base for the brickwork or blockwork above. In many designs, the beam also connects back to the existing foundations of the main house, tying the new structure to the old one.

What to watch

Check that the pile layout avoids any underground obstructions that were identified in the survey. Sometimes a pile position has to be shifted slightly to miss a drain run or a service. The

engineer can adjust the beam design to accommodate small changes in pile location.

It is also worth thinking about future maintenance. If you ever need to dig a new service trench close to the extension, the ground beam and piles will be in the way. Plan the position of any external taps, electric points, or drainage connections before the concrete is poured.

3. Mobilising the mini piling rig

On the day the piling work starts, the mini piling rig arrives on a low-loader or a flatbed truck. The rig is usually self-contained: it carries its own hydraulic system, a rotating head for drilling, and a mast that pushes sections of steel casing into the ground. Because the rig is narrow, it can be wheeled through a standard gate or manoeuvred along a side passage. Some rigs are even small enough to be carried by hand in sections and assembled on site.

The operator positions the rig over the first pile location using the engineer's layout drawing. They then set up a temporary reference point, such as a string line or laser level, to keep the piles in a straight line and at the correct spacing.

What to watch

Watch the access route again during setup. The rig may need to reverse out of the garden after each pile is drilled, or it may work from a central position and swing its mast to reach multiple points. Make sure the ground surface is firm enough to support the rig's weight. If the garden is soft or waterlogged, the operator may lay temporary track mats to spread the load.

If you have a garden room or a shed that cannot be moved, tell the piling contractor before they arrive. They may need to adjust the rig position or the sequence of drilling to work around it.

4. Drilling the piles

The drilling process starts with the rig spinning a steel auger into the ground. As the auger cuts through the soil, the operator adds sections of steel casing behind it to prevent the hole from collapsing. For a typical domestic mini pile, the casing is usually between 150 mm and 300 mm in diameter. The rig drives the casing down until it reaches the pre-determined depth, which is often a few metres below the surface, sometimes more if the ground is weak.



Once the casing reaches the target depth, the operator removes the auger and inspects the bottom of the hole. They then lower a reinforcement cage made of steel bars into the casing. The cage gives the pile its tensile strength. After the cage is in place, they pour a high-strength concrete mix into the casing, filling it from the bottom up. The concrete displaces any groundwater and bonds with the steel. The casing may be left in place or withdrawn in stages, depending on the ground type and the design.

What to watch

During drilling, listen for any change in the rig's sound or vibration. A sudden slowdown can mean the auger has hit a rock or a buried obstruction. The operator should stop and check before continuing. If the obstruction is a large boulder, the pile may need to be relocated slightly.

Also, keep an eye on the concrete delivery. The concrete for piling is a special flowable mix that must be poured continuously. If the supply is interrupted, the pile can have a weak joint. The operator should have a backup plan, such as a second concrete truck on standby.

5. Installing the ground beam and connecting to existing foundations

After all the piles are cast and have cured for a few days, the next step is the ground beam. The beam is usually cast in situ, meaning a timber or steel formwork is built on top of the pile caps.

Reinforcement steel is laid inside the formwork, linking each pile to the next. The beam also includes starter bars that will later tie into the extension's wall blocks.

At the same time, the connection to the existing house foundation is made. A recess is cut into the existing concrete, and new reinforcement bars are drilled and grouted into it. These bars overlap with the ground beam reinforcement, creating a continuous structural connection.

What to watch

Make sure the ground beam is level. The formwork should be set to the exact height shown on the engineer's drawing. If the beam is out of level, the brickwork above will be difficult to lay straight. A laser level check before the concrete is poured can save trouble later.

Also, check that the connection to the existing foundation is done correctly. The recess in the old concrete must be clean and free of dust. The bonding agent or grout used for the new bars should be applied according to the manufacturer's instructions. A weak connection here can lead to cracking where the new extension meets the old house.

6. Backfilling and finishing

Once the ground beam has cured, the area around the piles and beam is backfilled with clean soil or gravel. The backfill is compacted in layers to prevent settling. The top of the ground beam is usually left exposed so that the bricklayer can start work straight away. In some cases, a damp-proof membrane is laid over the beam before the walls go up.

The pile caps are trimmed flush with the beam, and any excess steel casing protruding above the concrete is cut off. The site is then ready for the next trades: drainage, underfloor heating, and finally the extension walls and roof.



What to watch

Backfilling should be done carefully to avoid damaging the ground beam or the pile caps. Heavy machinery used for backfill can bump against the concrete and cause hairline cracks. It is often better to use hand tools or a small plate compactor near the structure.

Also, check that the damp-proof course is continuous across the top of the beam. Any gap can allow moisture to rise into the wall, leading to damp problems inside the extension.

Relying on a specialist contractor

Domestic mini piling is a specialist process, and the success of your extension depends on getting the foundation right. A piling contractor with experience in tight-access domestic work will know how to handle the rig, how to adjust the design for tricky ground, and how to coordinate with your builder and engineer. Reputable firms like citypiling.co.uk provide engineered piling and foundation construction services for commercial and domestic building projects in the UK, so they understand the challenges of working on confined residential sites. For any domestic mini piling project, it pays to choose a contractor who can demonstrate a track record of similar jobs. Ask for references, check their insurance, and ensure they use a structural engineer to design the pile layout. A well-executed mini piling foundation will give your extension a solid base for decades.

If you are planning a home extension and are unsure whether mini piling is suitable, start by getting a ground investigation and a structural design. The engineer's report will tell you the soil capacity, the required pile depth, and the load that each pile can carry. With that information, you can approach piling specialists like citypiling.co.uk with confidence, knowing exactly what your site needs. The extra effort spent on the foundation stage saves time and money later, and it ensures your extension is safe, stable, and built to last.