FIRM FOUNDATIONS FOR YOU INC

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What Is Underpinning (Of A Building)?

Underpinning is the process of supporting or strengthening the foundation of an existing house, building or similar structure. This is accomplished by reinforcing the existing foundation, strengthening the soil by extending the foundation so that the load is distributed over a greater surface area.

When Is Underpinning Needed?

For most homeowners, underpinning is required when the original foundation is not strong enough to support the house. This is usually a result of:

- the soil supporting the foundation has changed in some way e.g. through set tling, expansion/ contraction due to moisture, large trees nearby, damaged plumbing left unrepaired.
- the properties of the soil were not adequately understood during the original design of the foundation - meaning the foundation is not adequate for the conditions.

In less common cases, underpinning is also required for the following reasons:

- The way the structure is used has changed e.g. following a major renovation
- New construction nearby resulting in the excavation of soil supporting existing foundations
- To increase the capability of existing foundations e.g. to support another storey to the building
- Natural disasters (floods or droughts) that have caused the structure to move or become unstable.

Why Do Building Foundations Fail?

There are several reasons why the foundations on a building might fail.

Change In Soil Moisture

Most frequently the problem relates to the movement of soils. This movement involves shrinkage (which leads to settlement) or expansion (which causes heaving). When dry conditions persist, soils gradually lose moisture and shrink. When moisture levels are elevated, such as during extended periods of wet weather, soils swell - sometimes by several hundred percent.

Both shrinkage and expansion of soil can compromise the integrity of the foundation, resulting in heaving, subsidence, and visible cracking in foundations and walls.

Poorly Compacted Fill

If a site was subject to fill, sometimes the material used is not sufficiently compacted to support the weight of the structure above it. In these cases, foundation problems often occur. The problem can originate from poorly compacted fill, the use of multiple fill materials, or both.

Site Erosion

Erosion can wear away the soil around foundations, to the extent that foundations become structurally compromised. Erosion can originate from a number of sources, such as a burst water pipe or other uncontrolled water flow or inadequate drainage.

Slope Failure

Failure of a slope relates to the movement of earth downhill. It could involve slow failure, known as “creep”, or sudden failure, which are “landslides”. Where a slope is failing due to creep, underpinning can be used to rectify the problem. However, this is very site specific and requires an expert assessment.

Trees

Trees are a significant factor in foundation failure. All plants remove moisture from the soil. Large trees removing moisture from the soil can significantly accelerate soil shrinkage. When trees are located too close to buildings, this can lead to the expansion or shrinking of soils enough to compromise the foundation.

Foundation Design

To a lesser degree, the design of the original foundation may have been inadequate. This could be due to the soil properties not being adequately understood during the original design of the foundation - meaning the foundation is not adequate for the conditions. However, due to modern building codes, this is less of an issue.

Do I Need Underpinning?

There are some indicative signs to look for when doing an evaluation of your own property. Underpinning is only required where settling is actively occurring. Sometimes after settling initially occurs, the structure reaches a state where no further damage my occur.

Cracks In Floors Or Walls

Cracks aren’t always scary. Sometimes they are superficial, such as minor or hairline cracks in plaster,

moldings and skirting boards. Bigger cracks are another story and usually point to bigger underlying problems, such as uneven weight distribution due to weak foundations.

Cracks to look for could be interior (plaster, wall and floor tiles) or exterior (brickwork, render, concrete slab).

Ideally try to observe the cracks over a period of weeks or months to determine if the cracks you've noticed get bigger, wider or longer - or if new cracks appear. If they remain unchanged over a long period, the settling has likely run its course and the house has settled.

Floor Not Level

Something that isn't always as obvious as cracks is unlevel floors. When you can identify them however, a lean to one or more sides of your home is a strong sign that there are significant foundation issues at play.

In serious cases we've seen, you can stand at one end of a hallway and see the fall of the house as you look down the hall. Other times, unlevel floors will contribute to misaligned doors. Generally, you can use a level to get some idea of how unlevel a room is. Or place a ball in a room and see if it remains still or if it rolls in a particular direction.

Another thing to look for are irregular trenches forming around the edge of the building or slab, in the top layers of the soil. This is another sign of subsidence.

Doors And Windows Out Of Alignment

Doors and windows can be good indicators of foundation problems. Gaps appearing and getting wider around your windows and doors. Finding it hard to close (or reopen) your doors or windows, or not being able to lock them.

In more advanced cases, there are more visible leans to door, and door or window frames may begin pulling away from their surrounding walls.

Will Underpinning Provide A Permanent Fix?

The answer to this will ultimately depend on the soil your home is sitting on and the type of underpinning service you choose to remedy your problem.

Not all types of underpinning are suited to all foundation problems. When we do our free home assessment, we let you know up front if our method of underpinning is able to provide a permanent fix for you. If not, we won't quote you and will recommend an alternate course of action.

The reason we exclusively use screw pile underpinning is because it is the most reliable underpinning method available.