

The Homeowner's Guide to
FOUNDATION
REPAIR



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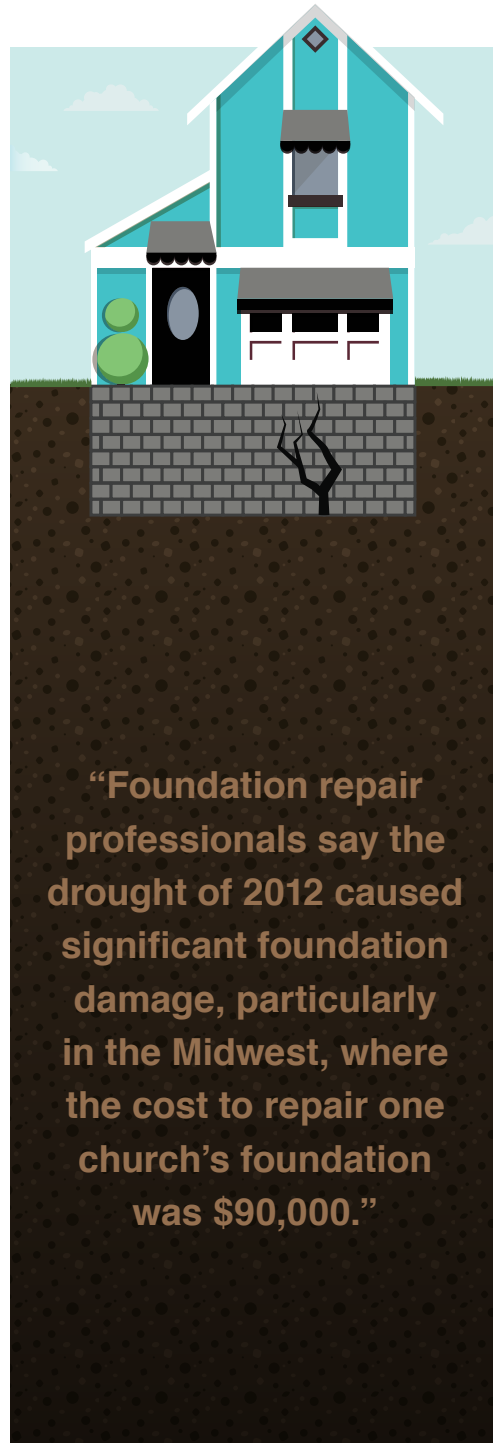
Introduction

Your home's structural integrity depends on the strength of your foundation. It supports everything else – walls, windows, floors, doorways, roof – so when your foundation is damaged, it can cause serious problems throughout your home.

Like most things in life, your foundation is subject to environmental stress. Expanding and contracting soil, excessive moisture and inadequate drainage are some of the most common threats to your home's foundation. Over time, environmental stressors can cause a foundation to shift, crack or settle unevenly. And homeowners often miss early warning signs of foundation damage.

Homeowners spend about \$4 billion annually stabilizing faulty foundations, and those costs may increase as more homes are built in areas known for shifting soil. ²

Understanding risk factors and signs of foundation problems can help you protect your most valuable asset from irreversible damage. Read on to learn the most common signs of foundation damage, methods of repair and associated costs, as well as how to choose the right person to repair your foundation.



“Foundation repair professionals say the drought of 2012 caused significant foundation damage, particularly in the Midwest, where the cost to repair one church’s foundation was \$90,000.”

Signs of Foundation Problems

Older homes are known for having quirks — a creaking floorboard here and there, a window that rattles when the wind blows — but some peculiar features may be a sign of foundation damage.

When your foundation shifts, the structures above may begin to fail. Bowed walls, crooked door frames and warped floorboards are often caused by foundation damage.

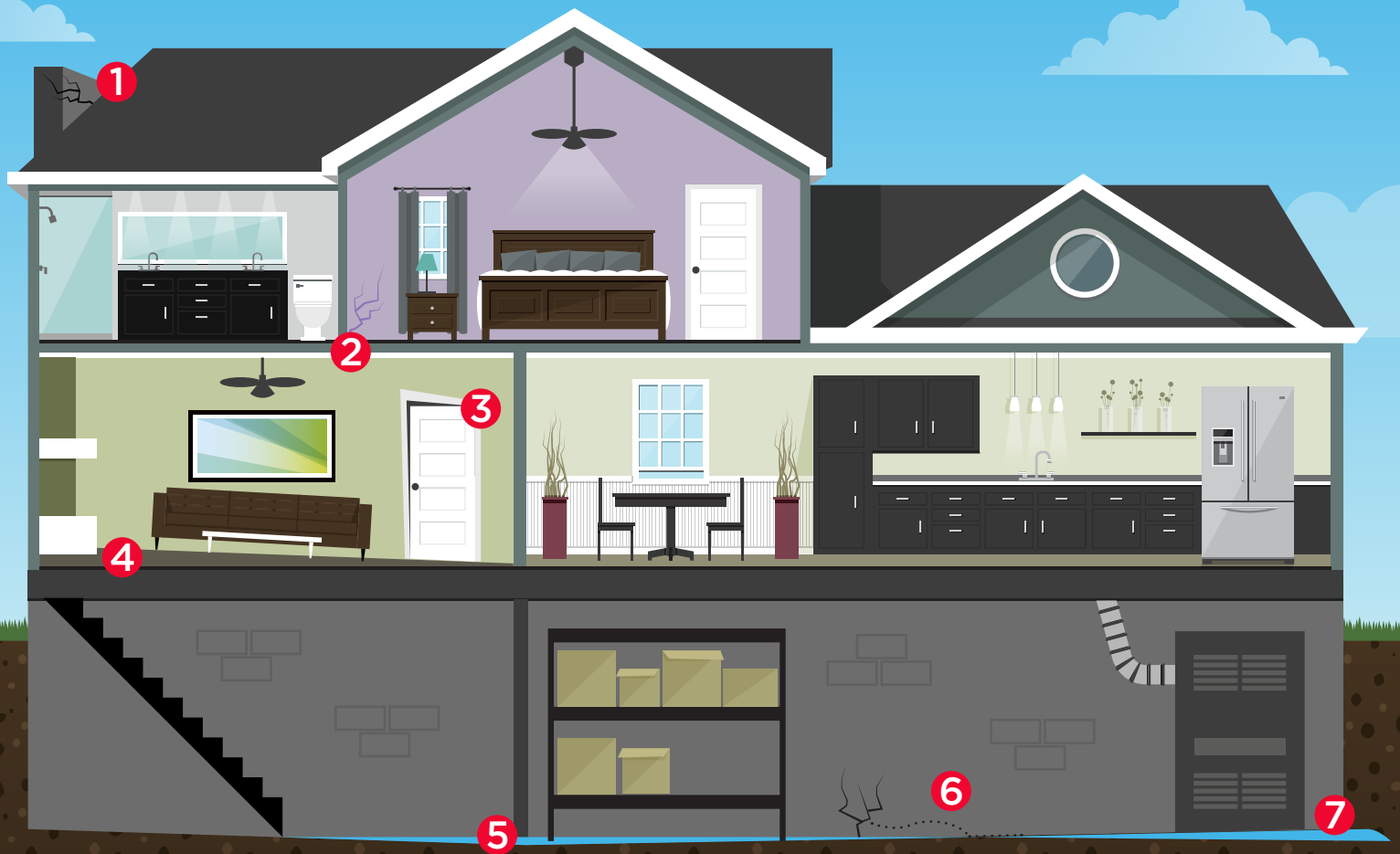
Usually, the first indicators of foundation damage are subtle. You may notice a musty smell in your basement or see fine cracks in the walls that grow larger over time. And foundation problems can and do occur in newer homes, too, particularly when they're built on unstable soil.

When you know the signs of foundation damage and make a habit of inspecting your home regularly, you may be able to correct small issues before they become major problems.

FACT

Homes built in the past decade may be prone to foundation trouble, as developers continue to build in areas known for shifting soil. In most states, homeowners have 10 years or fewer after construction to pursue a builder for negligent construction.³





Every home is built on a foundation that supports the building's structure. Residential homes may have a slab, crawl space or basement as part of the foundation. When the foundation is compromised, various problems such as sagging floors, bowed walls and other issues become visible within the home. In many areas, foundation problems begin with the soil underneath and surrounding the house.

Simply put, the movement and shifting of the soil underneath your home is often the root of foundation problems. Signs and symptoms of these foundation problems include:

4. Uneven or Sagging Floors:

Warped or sagging flooring can be related directly to foundation problems. Shifting soil, humidity from water seepage and inadequate foundation waterproofing can contribute to flooring issues.

1. Cracked Chimney:

Poor exterior drainage or expanding soil can cause foundations to crack and settle, resulting in a tilting or cracked chimney. Unstable chimney foundations can be fixed with Olshan's Hybrid Piling System.

5. Basement/Crawlspace Moisture:

A wet, leaking basement or crawl space moisture can contribute to several home issues including musty smells, mold growth and sagging, uneven floors throughout the house.

2. Cracked/Bowed Walls:

Cracks and bowing in walls can be fixed. However, there is often an underlying issue — soil movement under the foundation, hydrostatic pressure and poor water drainage are three common culprits.

6. Bugs in the Basement:

Bugs such as centipedes, pill bugs, silverfish, earwigs, carpenter ants and roaches are drawn to wet basements and often enter through cracks in the foundation.

3. Crooked Doors:

When a foundation settles, cracks or shifts, problems such as crooked doors develop in the house. Like flooring and wall issues, crooked doors may occur because of moisture issues in the basement or crawl space.

7. Standing Water Under House:

Rainwater must divert away from the house via gutters, properly directed downspouts and drainage systems. Improper drainage often causes water to collect under the house, resulting in foundation problems.

The Essential Homeowner's Foundation Health Checklist

Foundation problems can develop whether your home has a slab foundation, a crawl space or a basement. When you catch potential signs of foundation damage early, you may be able to avoid extensive and costly repairs. Make a habit of regularly inspecting your home for various signs of foundation damage. Using our foundation health checklist below can help.

INTERIOR CHECKLIST

In the basement, the following may appear as signs of foundation problems:

- Moisture — beads of water along walls or in window wells, dampness and any puddle formation are signs of moisture in the basement.
- Mold — mold, mildew and musty smells often accompany basement moisture/leaky basements.
- Cracks — cracks shaped like stairs can be a sign of differential foundation settlement, an issue that needs professional repair.
- Bugs — silverfish, pill bugs and other insects are drawn to moisture allowed in through cracks caused by foundation problems.
- Leaks — intrusive water can find its way into your basement from under and over the footer and through mortar joints; you might even discover unseen subsurface water underneath the floor.

In the upper levels of the home, the following may appear as signs of foundation problems:

- Uneven, sagging or warped floors
- Bowed walls
- Cracks in walls and ceilings
- Separation of baseboards from walls, especially at corners
- Crooked doors and/or doors that won't open/close properly
- Cabinet doors that hang askew
- Windows that stick (are hard to open and close)
- Musty odors that originate in the basement and enter the living areas of the home as hot air rises

EXTERIOR CHECKLIST

One of the best ways to defend against foundation damage is to ensure adequate drainage around your home. The ground should slope away from exterior walls at a 10 percent grade, and gutters and downspouts should be free of debris. ⁴

Periodically check the exterior of your home for possible signs of foundation damage, including:

- Cracked chimney — improper exterior drainage may be the cause of chimney cracks.
- Cracks in the exterior basement walls.
- Building corners that appear separated.
- Portions of the house that seem to be sagging into the ground.
- Pooling water or swampy spots in the lawn, especially near the foundation.



TIP

As you inspect your home, photograph your walls and the perimeter of your home. Then you'll be able to compare photos over time to look for any changes that could indicate foundation damage.

Types of Foundation Problems

Foundation problems can arise whether your home sits on a slab, crawl space or contains a basement. A wet basement, sagging floors and cracks in walls are often indications of foundation problems. However, the causes of foundation problems may not be immediately visible.

Foundation problems typically arise from:

Settling

All homes settle to some degree, but significant settling can occur because of soil expansion and contraction, or because of structural issues with footings and piers.

Movement

A home's foundation may shift along with seasonal changes that affect soil, such as "frost heave," which occurs when freezing groundwater forces soil upward. Earthquakes and floods can also cause foundations to move.

Cracks

Invasive tree roots, poor drainage and plumbing leaks are main contributors to foundation cracks. This type of damage often creates other problems such as mold growth in the basement/crawl space, water seepage into the home and insect infiltration. Some cracks occur as part of a home's normal settling, but large cracks or ones in a stair-step pattern may indicate foundation damage.

Erosion

If your home has poor exterior drainage, water can build up against or under the foundation, causing erosion. Around the perimeter of your home, the ground should slope away to ensure water doesn't accumulate in the soil around your foundation.



FACT

"The U.S. Department of Agriculture estimates 50 percent of all homes in the U.S. are built on expansive soil."⁵

Causes of Foundation Problems

Foundation problems can arise any time and in any home. Soil conditions often are the cause of many foundation issues, particularly following periods of prolonged heavy rain or excessively dry weather.

Soil with high amounts of clay is known as “expansive soil,” meaning it’s prone to expanding and contracting. Expanding soil puts pressure on a home’s foundation, causing shifting, cracks and other problems. And when soil contracts, the foundation may shift due to lack of support.

Expansive soil is a problem in many parts of the country; if you live in an area with expansive soil, you should be on the lookout for foundation damage.

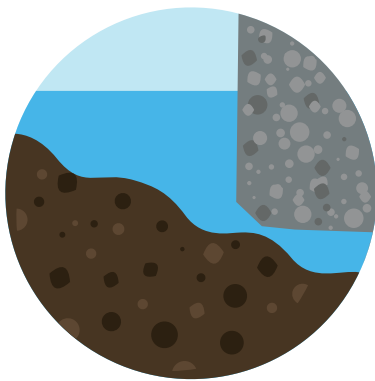
UNITED STATES EXPANSIVE CLAY SOIL MAP



- Over 50% of these areas are underlain by soils with abundant clays of high swelling potential.
- Less than 50% of these areas are underlain by soils with abundant clays of high swelling potential.
- Over 50% of these areas are underlain by soils with abundant clays of slight to moderate swelling potential.
- Less than 50% of these areas are underlain by soils with abundant clays of slight to moderate swelling potential.
- These areas are underlain by soils with little to no clays with swelling potential.
- Data insufficient to indicate the clay content of the swelling potential of soils.

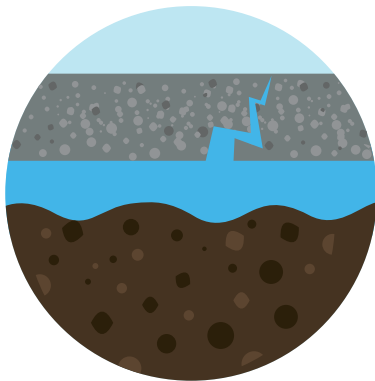
Other Causes of Foundation Problems

In addition to expansive soil, many homes' foundations are adversely affected by the following problems:



Improper Drainage

The most common sign of poor drainage is water pooling and forming swampy areas near a home's foundation; another indication is a damp or leaky basement. Poor drainage can occur as a result of clogged or damaged gutters, or because the land surrounding a home isn't properly graded away from the structure.



Water Leaks Under The Slab

Slab foundations conceal sewer lines and water pipes; when a leak develops in a hidden line, it can cause the slab to deteriorate. This type of problem may cause moist areas in interior floors, or homeowners may notice a sudden spike in their water bills — but more often than not a slab leak will go unnoticed. Leak isolation testing is the preferred method for detecting slab leaks.



Tree Root Intrusions

Large trees can cause foundation problems as roots grow through the soil underneath the home. The intruding roots can exert significant pressure on under-slab water pipes and basement foundations. They can also leech moisture from the ground, causing soil to contract away from the home.

Foundation Repair Methods

Foundation problems need to be repaired correctly — and sooner rather than later. Once foundation problems occur, they can lead to several other problems, including — but not limited to — sloping floors, cracks in interior walls and/or ceilings and cracked exterior walls.

A certified repair specialist can inspect your home to determine the extent of damage and provide a foundation repair estimate.

Methods of foundation repair and preservation include:

Waterproofing

Foundation waterproofing helps eliminate invasive moisture to crawl spaces and basements. Too much moisture often causes mold growth and leads to excessive humidity in other areas of the home. Foundation waterproofing can be accomplished one of two ways: through interior water management, a method that allows water into the basement or crawl space and then manages it away; or exterior water management, a method that defends against water from the foundation's exterior. Both methods are effective and can include vapor barriers, dimple boards, dig-outs, sump pumps and drainage as part of the repair.

Crawl space encapsulation

Vapor barriers are used to encapsulate the wall and sometimes floors of the crawl space to discourage mold growth and improve indoor air quality. This repair often includes an air exchange system designed to circulate clean air into the home. A non-ventilated, “conditioned” approach can also be effective, and uses the home's air-conditioning system to keep temperatures cooler inside the crawl space.

Crawl space restoration

When floors have begun to sag due to foundation damage, support columns can be installed in crawl spaces to level the floors and shore up the foundation. These adjustable posts help to move the floor back into proper position.

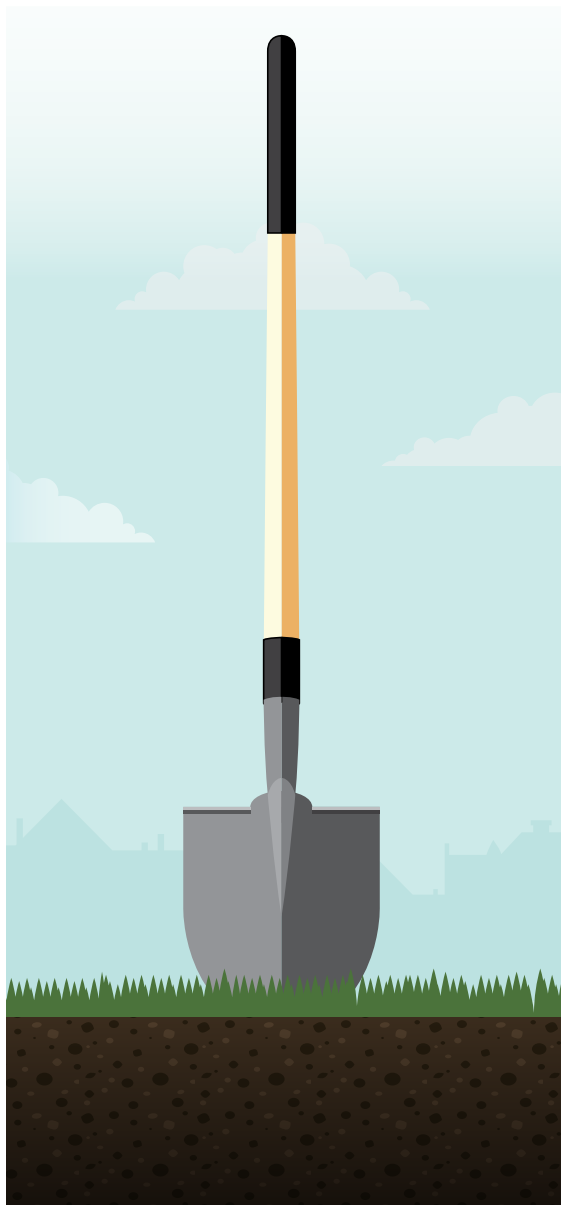
Foundation leveling

When tree roots or other issues cause your foundation to sink or settle, a foundation leveling system can fix it. This repair involves raising the foundation in some cases, or installing additional supports. Keep in mind that no home will ever truly be level — not even new homes — but noticeable leveling issues almost always cause damage.

Foundation Repair Methods continued...

Drainage management

A properly drained property keeps harmful water away from your home's foundation, eliminating many structural and cosmetic issues such as cracks in walls and standing water under the slab. To prevent further damage to your foundation, a supplemental exterior drainage system may need to be installed. Drainage systems can include a variety of products and services such as surface drains, double barrel drains, gravity discharge, footer drains and more. When installing a drainage system, request that a cleanout is included. This will make maintenance easier and can improve the system's performance.



Wall repair

Depending on the type of damage, basement and crawl space walls can be repaired or even patched cosmetically using a variety of techniques. Adjustable wall braces are used to stabilize poured concrete or to block walls that bow. Epoxy crack injections help seal cracks and carbon fiber strips can be used to support cracked or bowing block walls. For more extensive damage, a wall anchor can be used to restore the wall's appearance and dramatically improve wall stability.

Air exchange

Due to a phenomenon known as the "stack effect," foundation problems can lead to air quality issues like musty smells, mold growth and high indoor humidity. Air quality systems improve the health of the home by eliminating bad air from the lower areas of the home and circulating clean, healthy air into the living areas above the foundation.

How to Select a Contractor

If you've spotted telltale signs of foundation damage in your home, you should schedule a professional inspection as soon as possible. But you also want to take time to find the right person for the job. Unfortunately, there are people who make a living scamming unsuspecting homeowners, taking money for repairs and never completing them or performing sub-par work and disappearing.

Following are some key questions you should ask before hiring a foundation repair professional:

How much experience do you have?

Ask how many years of hands-on foundation repair experience a contractor has.

Where can I find your reviews or references?

A reputable contractor or company should be comfortable with you asking for reviews or references. You should also check with the Better Business Bureau in your area to determine whether any complaints have been filed against the person or company you're considering for the job.

Are you insured?

Ask for an insurance certificate, and examine it carefully to make sure it's current.

Do you guarantee your work? Ask about the specific terms of the company's warranty, and never hire anyone who refuses to offer a warranty.

Do you provide a written estimate?

Anyone performing work on your home should provide an estimate in writing before work begins.

Do you provide a written contract?

You should never hire anyone who won't offer you a contract. And when reviewing the contract, make sure the projected start and end dates for the repairs are clearly outlined.

How to Select a Contractor continued...

How long have you been in business?

The foundation repair industry is full of companies that come and go. Longevity is important; a warranty is only good as long as the company that issued it is still in business.

Do you offer financing?

If you can't pay for the entire repair at once, financing becomes a priority. Not every repair company offers this option, so this is a key question to ask at the beginning of the process.



How Much Does Foundation Repair Cost?

In 2012, the United States experienced one of the worst, most prolonged droughts on record. At one point, drought conditions covered states from Delaware to California, destroying crops and causing significant foundation damage as dry soil shrank away from homes.⁷

A homeowner who had first noticed signs of foundation damage in 2011 estimated his repair bill would be close to \$50,000 for 2012's drought-related damage because his sidewalks, driveway and landscaping would have to be replaced.⁸

Foundation problems often lead to other issues around and within your home. That's why it's important to catch foundation problems quickly and repair them before other damage occurs. A problem that might cost \$1,000 to fix today could become a \$5,000 repair job if you wait too long to address it.

Typical costs

On average, basic foundation repair services range from about \$3,000 to \$6,000, depending on the extent of the problem and the size of the property. Some homeowners receive a pleasant surprise after an assessment reveals that an extensive repair job is not necessary. Some homes may simply need preventive foundation maintenance, which could cost between \$500 and \$3,000. Any company inspecting your foundation should offer you a free estimate, as well as a warranty for any work performed.

Insurance coverage

While insurance may cover foundation damage that results from an earthquake, flood or other single event, drought-related foundation damage is often not covered by insurance. However, you may be able to work with companies to finance repair work.

FACT

One Kansas City homeowner nicknamed his residence “the fun house” after foundation damage caused rooms to tilt as much as four inches.⁹

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This e-book is brought to you by Olshan Foundation Solutions, which has been providing comprehensive foundation repair services since 1933. Olshan offers a suite of home services that include basement waterproofing, crawl space waterproofing and encapsulation, plumbing services, under slab plumbing, wall anchoring, air quality management and drainage.

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