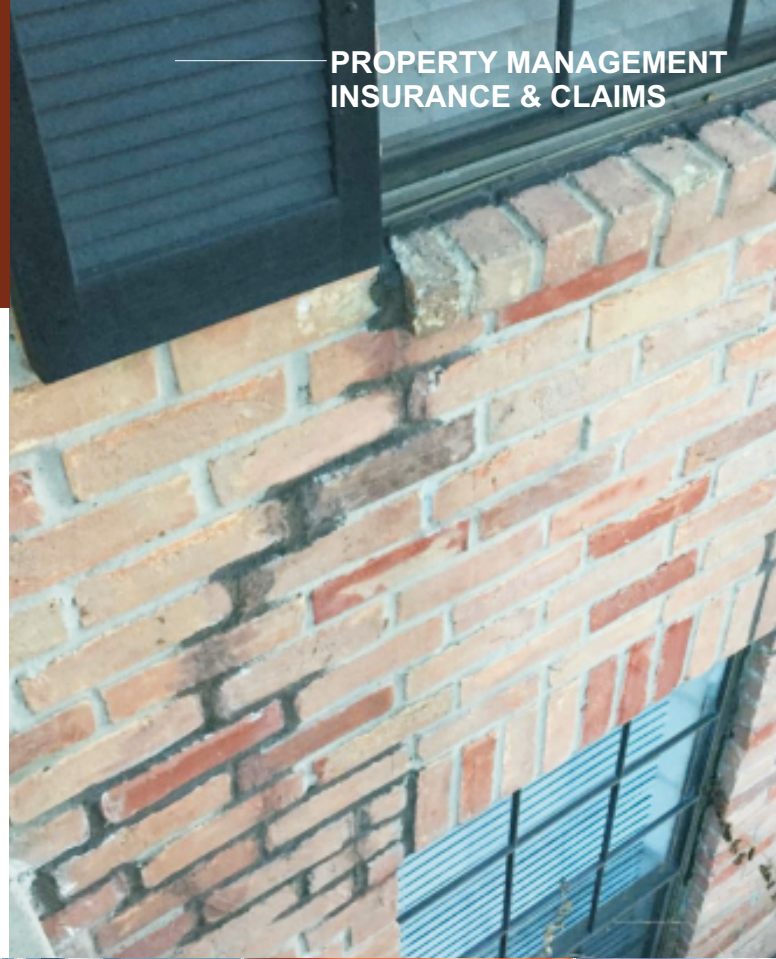




CRACKING THE CODE ON FOUNDATION CRACKS



ACCURATE, TIMELY, AND ALWAYS QUALITY CONSCIOUS





Unsure if you need an expert to visit your condo, apartment or multi-dwelling buildings?

Here are the top 15 warning signs that may indicate a potential failure in the property's foundation.

Building foundational cracks are a commonly found problem in many concrete-poured structures.

They can occur in single-family homes, apartment buildings, or condominium complexes.

They are by no means limited to the residential sector. It is just as common in the commercial, retail, and industrial sectors throughout Canada. Temperature change and ground movement are amongst the leading causes.

Many foundation cracks are not necessarily of immediate concern as in the case of gradual shifting and/or "settling" property.

Others, due to substandard construction or erosion, may be more much serious and could pose significant short and long term issues for the property.



1. Crumbling concrete
2. Flaking concrete
3. Cracked walls
4. Floor cracks and gaps (e.g. cracks in basement floor)
5. Calcium stains
6. Wet basement
7. Leaky basement
8. Pyrite
9. Water damage
10. Soil shifting
11. Sloping landscape
12. Sagging floors
13. Warped ceilings
14. Concrete contraction
15. Poorly fitting doors and windows

Spot a crack in your foundation? The first step to repairing a foundation crack is to identify what type of crack it is.

Here are the 10 most common types.

1. Horizontal Cracks
2. Stair Step Cracks
3. Hairline Cracks
4. Vertical Cracks
5. Diagonal Cracks
6. Shrinkage Cracks
7. Foundation Slab Cracks
8. Non-Structural Cracks
9. Wet Non-Structural Cracks
10. Structural Cracks



Horizontal Cracks

Horizontal cracks in a foundation can be serious. This type of crack is often due to unbalanced soil and hydrostatic water pressuring/pressing against your foundation wall.

You may notice the foundation bowing inwards and water leaking into the basement. Both block and poured foundations can develop horizontal cracks.

Horizontal cracks are common, they are found below grade where the frost line is located and often caused by the freezing and thawing cycle.

Over time this can create unbalanced pressure on the foundation wall creating a horizontal crack.

TOK Tip: The good news is horizontal cracks can be permanently repaired with lifetime guarantees and transferrable warranties by many repair professionals.



Stair Step Cracks.

Block foundations are prone to “stair-step” cracks. These types of cracks happen along mortar joints and can pose a serious threat to the integrity of your basement foundation.

There are two common causes of stair-step cracks:

1. Foundation settlement or localized sinking in one area
2. Moisture related problems outside your foundation

TOK Tip: If you can put more than a quarter in the foundation crack call a trusted source for inspection and repair options. While some mortar-based hairline cracks are common, anything larger may pose a significant threat.



Hairline Cracks

Hairline cracks are commonly found in new construction foundations across the country.

They usually appear within the first year and are caused by the settling and drying of the new foundation.

The good news is these cracks are usually cosmetic in nature and can be repaired.

TOK Tip: If you are dealing with new construction and discover a hairline foundation crack, your building warranty may cover the repair cost. Make sure to take photos to document the crack and monitor progression

Diagonal Cracks

Like vertical cracks, most diagonal foundation cracks do not necessarily pose a serious threat to the structural integrity of the foundation.

They are found running at a maximum 30 degrees off vertical and caused by the natural curing of the concrete foundation wall and/or settlement over time.

TOK Tip: When diagonal crack is spotted, take a photo, and document the date. If the crack is hairline and a quarter cannot fit into it, then there should be no immediate concern.

Check again in 6 months. If the crack has continued to grow, then call a professional for further advice and consultation.



Vertical Cracks

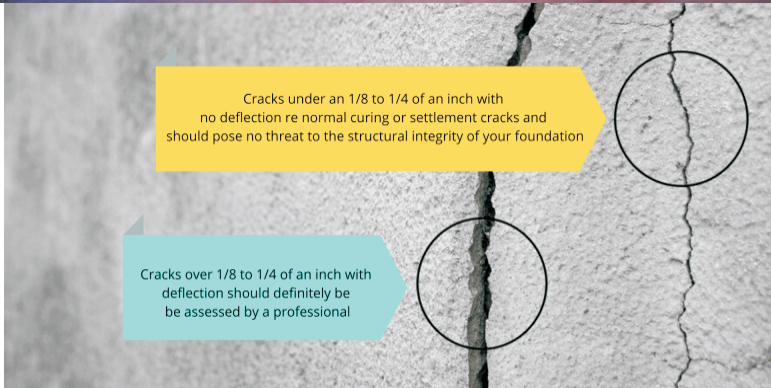
Vertical cracks in a foundation wall are less serious than horizontal cracks and usually do not pose a structural threat.



They are commonly found in poured foundations running straight up and down your wall. Vertical cracks are one of the most common crack types found in basements.

They are due to the foundation settling over time or the natural concrete curing process

TOK Tip: If there is no moisture and a quarter will not fit in the crack, there is likely no immediate threat. Take photos and monitor any crack progression. Repair with epoxy injection.



Shrinkage Cracks

Like hairline cracks, shrinkage foundation cracks happen when poured concrete foundations begin to dry out and lose moisture.

New builds are prone to shrinkage cracks within the first year. These cracks are often vertical and pose little structural threat to your foundation.

The only risk is if the property is in an area with high levels of Radon Gas that could potentially leak into the basement level.



Structural Foundation Cracks

These types of cracks are extremely serious as they pose a risk to the integrity of any structure. A sure sign of a structural deficiency are horizontal cracks, and cracks wider than a 1/4 inch.

Structural foundation cracks are normally the result of movement, whether it's caused by temperature changes, soil pressure or soil shrinkage.

Because the crack was initially caused by stress resulting from movement which may continue, temporary solutions (epoxy) alone are not generally enough to ensure the repair of the crack.

Further reinforcement, in the form of carbon fiber countersunk staples or straps, are often necessary to ensure that the crack does not expand.

TOK Tip: If you spot water or moisture coming from a crack; the faster you act the better. Edmonton's quickly changing weather patterns can cause the crack to grow and may lead to more water issues.



Foundation Slab Cracks

Poured concrete slabs are prone to developing cracks over time. The challenge is understanding why the foundation slab crack has occurred.

There are three common reasons:

Concrete Curing: The most common reason is the natural drying, settling, and curing of the concrete slab. This poses no structural threat and is mostly cosmetic.

Slab Settlement: If a new foundation slab develops cracks due to settlement issues; this is significant.

This may be caused by poor, initial workmanship where the supporting ground was not sufficiently compacted or by poor soil conditions. Call a professional for an inspection right away.

Frost Heave: Crawl space slab foundations that sit at or above grade are at risk of frost heave. During freezing, moisture underneath the slab can freeze, expand, and cause the concrete to buckle.

TOK Tip: If the crack is larger than a hairline, call a reputable expert to get advice on the cause and options to repair.





Tree of Knowledge (TOK) Engineering

If you think you have a structural foundation crack issue, then feel free to contact us at TOK Engineering.

Text or email us a photo of the foundation crack and we shall respond immediately.

Do not necessarily be alarmed if you see any of these signs in your condo, apartment, or multi-dwelling property. Simply, be pro-active. As has already been pointed out in this article, many of these situations, do not necessarily pose a serious structural risk.

Bottom line: It is always a wise choice to consult a professional to determine if a foundation crack is normal or an indicator of a more serious issue.

Non-Structural Foundation Cracks

A non-structural foundation crack is one that normally does not pose a threat to the structure of the home, and typically only results in leaks during rainstorms or snow melt.

Despite the lack of structural threat, water seepage into your basement can still be a serious matter that requires attention.

Water leaking into your property can ruin contents, walls, and floors, and contribute to the growth of mold; especially in a fully-developed basement.

Left unattended, these types of cracks may get worse and, at the very least, must be monitored.



Wet Non-Structural Foundation Cracks

This type of crack is the result of foundation shrinkage due to water evaporating from the concrete. It would typically happen within the first month after a foundation is poured.

The wetter the concrete mix was initially, the more shrinkage will happen, increasing the likelihood of cracks forming. The natural setting of the concrete can also lead to cracks.

TOK Tip: If you spot water/moisture coming from a crack the faster you contact the original contractor the better. Alberta's quickly changing weather/humidity patterns can often aggravate this issue.

A Synopsis of Foundation Cracks



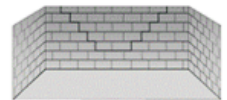
Angled and Horizontal
Result of Bowing Walls



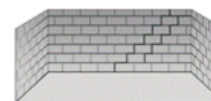
Angled Cracks
Result of Foundation Settlement



Vertical and Horizontal
Result of Bow and Settlement



Center Converging
Result in Bow or Settlement



Stair Step
Result of Heave or Settlement



Vertical
Result of Settlement or Heaving



Vertical Wide at Top
Side Settlement



Vertical Wide at Bottom
Center Settlement