



DEFUSING A TIME BOMB

Installing Liquid Backfill during Construction Protects Your New Home Investment

By Trilby Henderson

Your new home is sitting on a ticking maintenance time bomb when the backfill installed around the foundation has not been compacted to a pre-excavation standard necessary to ensure compliance with the **National Building Code**. Code 9.12.3.2 states: *Backfill shall be graded to prevent drainage towards the foundation “after settling.”*

Despite being one of the most critically important elements of any new home, backfilling is generally an area overlooked or neglected by new homebuilders. Proper backfilling is important throughout Saskatchewan. However, it is especially important in the expansive clays of Regina, where there is potential for 18 inches of

progressive backfill consolidation and settlement, which is commonplace to the typical poorly backfilled foundation.

Your new home may initially appear properly graded to prevent drainage toward the foundation. However, it is likely the builder failed to compact the backfill to account for “void content” in accordance to the “after settling” Code condition that addresses subsidence of the grade around the foundation within the first few years.

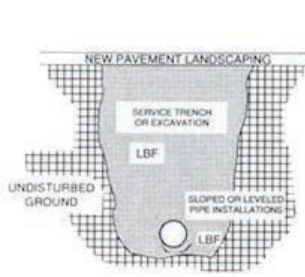
THREE DECADES OF LIQUID BACKFILL HISTORY

Over the past three decades, Gunner Corp. has been putting its unique, innovative and highly effective product — **Liquid**

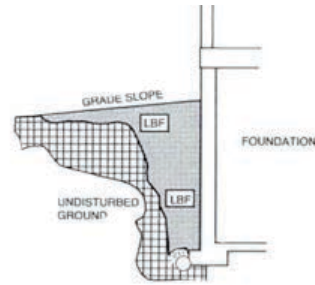
Backfill — to work helping home and business owners prevent foundation seepage, wet basements and settlement problems specifically caused by poor backfilling methods.

Clint Kimery, president of the Regina-based company, says Gunner Corp. developed Liquid Backfill, a special low-shrink, impervious, clay-based material combination, in conjunction with the Canadian Research Council in the early 90s.

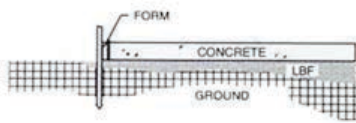
Since then, Liquid Backfill has proven to be a cost-efficient application, used in such places as the backfill of new foundations, backfill of utility trenches, and replacing sand base with an impervious clay base under driveways, walks and patios, where it is important to



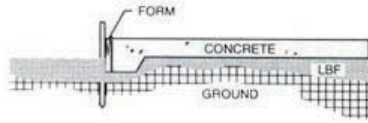
SERVICE EXCAVATION



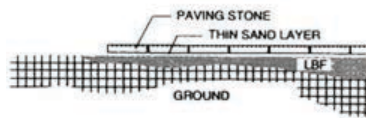
NEW FOUNDATION EXCAVATIONS



SLAB ON GRADE



BUILDING SLAB ON GRADE



PAVING STONE

prevent water from collecting in the base material to freeze-thaw, wet-dry and cause shifting and crack damage.

“There is zero settling with our natural universally compacting fill material, which is equal to an undisturbed ground condition that will provide maintenance-free landscaping over the lifetime of your home,” says Kimery.

Liquid Backfill can prevent structural costs because it will simply protect and preserve the pre-excavation moisture condition of the bearing soil to create and maintain a stable environment equal to the original ground condition. “Liquid Backfill provides maintenance-free grade stability, therefore the homeowner is not required to annually chase a settling grade with a wheelbarrow of dirt and a shovel,” Kimery says.

Water runs downhill and free water does not run through clay. These are the two guiding principles Liquid Backfill is simply based on with respect to being able to maintain a dry and stable basement condition.

DON'T RELY ON WEEPING/ DRAINAGE TILE

While weeping/drainage tile installed along the foundation footing may handle the bulk of run-off water for an improperly

backfilled foundation, it is not a system a homeowner should rely on. Keep in mind weeping/drainage tile is never installed on a slope to drain bases. Therefore, water is allowed to be held in every sag and dip of the tile. This resulting reservoir of water then facilitates a thin membrane of softened clay that follows along the underside of the concrete footings.

A natural characteristic of clay in contact with water is to create a thin self-sealing impervious membrane that prevents moisture from penetrating further down into the bearing soil/clay zone below the footing.

This thin horizontal membrane that forms along the underside of the concrete footing is too thin and soft to properly support the weight of the structure. As a result, the foundation becomes unstable and fractionally squeezes out and settles into the soft membrane. This situation reoccurs on each occasion water is permitted to collect within the weeping tile zone to again form a new soft clay membrane below the footing. Foundation heaving is a rare condition which requires a large body of clay below the footings to experience an increased moisture condition. Since clay is naturally self-sealing, this condition is simply not possible relative to typical site conditions.



ABOVE: Poorly backfilled foundations using lumps of clay will result in at least 18 inches of grade settlement in the first five to 10 years



ABOVE: Liquid Backfilled foundations will provide a maintenance-free stable grade and a dry basement.

Liquid Backfilled foundations create a condition that avoids this membrane problem by simply controlling water runoff away from the foundation. Under this control, basements stay dry and they are not subjected to mildew, mold or various types of insects that thrive in moisture.

Your sump pump is a water detector, a monitoring device not unlike your smoke detector. You would not be thrilled to have your smoke detector go off, nor should you be hearing your sump pump start up. Your sump pump is warning you about a water/grading problem progressively undermining your foundation.

Too often, topsoil or sand is mistakenly used as a re-grading material. While both are easy to handle and look better than the pre-filled condition, problems quickly arise when these types of materials become saturated, permitting water to simply run straight through and back toward the foundation to again follow the underlying negative clay grade leading down to the weeping tile. This continues undermining the stability of the foundation and the damp condition of the basement environment.

With proper backfilling practice, Regina could take advantage of its expansive clays, “to have the reputation for the driest foundations in all of Canada and maybe the world,” says Kimery. “Instead, the city is best known for unstable foundations and settling cracked concrete slabs. New homeowners place far too much reliance on their builder to initiate innovative products and options in the marketplace and fail to appreciate the crucial importance of specifying backfilling standards until it is too late.”

Certainly, the onus is on you, the new homeowner, to take the lead in protecting your long-term financial investment in your home without gambling or having to accept compromises a few years later when the time bomb starts imploding. At that time, you are on your own, the builder is fully paid and out of the picture while you are being told: “Well, that’s Regina for you!”

SPECIFY LIQUID BACKFILL

New homeowners must insist on proper backfilling standards and must hold their builder legally responsible to adhere to the Canadian Building Code backfilling directives. Liquid Backfill will provide a permanent foolproof backfilling condition homeowners will appreciate every spring and after each heavy rain.

Once Liquid Backfill flows into an excavation, it naturally solidifies equal to the original undisturbed ground condition. The key component of Liquid Backfill is clay, and the important characteristic of clay is that it doesn’t get wet or dry very easily. Liquid Backfill creates a “control grade” that preserves the pre-construction ground moisture condition, critical to long-term foundation stability.

How much does it cost to annually re-landscape your yard, to raise, realign or replace a settled foundation, or to replace or mudjack your driveway, patio, steps or sidewalks? By simply insisting on Liquid Backfill, this can all be avoided, along with the disappointment, worry, health risks and the loss of tens of thousands of dollars for repair costs. Consider also the long hours of back-breaking work — all eliminated by proper foundation backfilling.

“Liquid Backfill not only protects your investment — it is a prized sales feature to future buyers,” says Kimery. “With the

price of homes nowadays, the cost of a Liquid Backfill installation is miniscule.”

IMPROVE EXISTING NEGATIVE GRADE CONDITIONS

Liquid Backfill can also be applied to improve existing grades around older homes, under existing hard-to-access decks and concrete steps. It can be used to fill washout cavities under concrete slabs and to fill utility line trench excavations. It also provides a firm base for new concrete slabs or new paving stone installations. It is flexible to work with, can be installed in a matter of hours and can be poured into a variety of landscaping contours and special features — and, if necessary, can be easily excavated.

So go ahead. Don’t install proper backfill around your new foundation, let your grade settle 18 inches, let your driveway crack and settle, let your sidewalks crack and settle, let the water run down your foundation wall and into your weeping/drainage tile to

progressively settle your foundation and wet your basement. Hey, your sump pump will handle it all... right?

Gunner Corp. can absolutely guarantee the captioned photographs depicted in this article will represent the type of driveway, walk and garage floor conditions you can expect to develop around your new home over the next few years should you fail to insist on proper backfill standards.

Under these circumstances, a large part of Gunner Corp.’s business during the last 30 years has involved raising and realigning settled concrete slabs originally constructed on an improper base, as well as raising and realigning settled/wet foundations not properly backfilled when constructed. Generally, the settled concrete slabs will have numerous cracks and the foundations are settled at least two to four inches, and often much more, by the time Gunner Corp. receives a mudjacking call to straighten out the mess.



ABOVE: These settlement problems were caused by improper foundation backfill. The walk and garage floor seen here are in the process of being mudjacked back to original elevation.



ABOVE: These settlement problems were caused by improper foundation backfill. The settled driveways above are in the process of being mudjacked up as much as 18 inches back to their original elevation.

REMEDIAL MUDJACKING

Mudjacking is the process of raising settled concrete slabs such as driveways, sidewalks, slab garages and slab houses. This process involves drilling two inch holes through the concrete slab approximately four to six feet apart. Over a number of passes, Gunner Corp.'s special clay-base material is incrementally pumped through each hole, dispersing the weight of the concrete slab floating the slab up to the desired elevation.

IMPORTANT: MUDJACKING DOES NOT DAMAGE FOUNDATION WALLS

The mudjacking process is not based on a hydraulic principle that could exert sufficient lateral pressure to damage an eight or 10 inch foundation wall, while only raising a thin three to four inch concrete driveway, walk or patio slab. To further explain, it is important to understand there is no confined space below a concrete slab. The mudjacking nozzle is not mechanically anchored to the slab and is only held in place by simply standing on the nozzle. A thin slab would easily crack or the clay-base grout exits from an adjacent hole at the same rate it is being pumped in. Furthermore, packed dirt along the leading edge of a concrete slab is generally sufficient to hold the grout under the slab while it is being raised, often above the existing

grade. Basically, there are no pressures created during the mudjacking process that could damage a foundation. Such a circumstance is physically impossible.

While mudjacking can be used to realign a concrete slab back to original elevation and to fill voids and cavities under that slab, mudjacking cannot alter the underlying ground condition, which may still contain void content which may still likely require mudjacking again. Keep in mind, newly replaced concrete slabs are also subjected to the same poorly compacted conditions.

The beauty of mudjacking is it can be re-mudjacked indefinitely using the same hole configuration, until such a time as the underlying ground manages to return to a pre-excavation state of compaction.

COMPACTION GROUTING

Compaction grouting is the process used to raise settled foundations. This acknowledged structural engineering process involves installing injection pipes below the concrete spread footings or concrete piles supporting the structure. Depending on the severity of settlement, as determined by an elevation survey, the injection pipes are spaced accordingly to be sequentially

injected with Gunner Corp.'s special blend of grout material.

The injected material creates an expanding grout-bulb that causes displacement of the underlying ground, resulting in a progressive heaving of the ground mass below the foundation, raising the monitored foundation upwards to the elevation required.

Along with the vertical lift of the foundation, there is generally unavoidable collateral damage relative to the raising of any rigid structure by any method due to special conditions and the history of each structure. Owners should therefore arrange for a miscellaneous repair contingency fund to cover these additional costs.

Gunner Corp. has the years of skill and experience behind its quality work, along with the right equipment to properly address any remedial application: Liquid Backfill, Mudjacking, or Compaction Grouting — residential, commercial or industrial.

Although the company primarily works in and around Regina, projects are also completed throughout Saskatchewan, in other provinces and internationally. ■

Gunner Corp
682 Adams Street
306.775.2626
www.gunnercorp.ca