The Slab-On-Grade Alternative - Do You Really Need a Basement ?

In the last 20 years we as a society have come to the conclusion that living underground is not pleasant - It is damp in the summer, cold in the winter, dark all year round, plagued with mold, mildew, and of course, what everybody dreads - water leaks.

Historically, there was a need in northern climates to dig below frost. Settlers in Canada built stone perimeter frost walls that were typically not deep enough to prevent frost heave with no basement.

Figure 1: Frost walls on older homes were typically not deep enough to prevent frost heave and sagging foundations

As technology advanced with the on-set of central heating the frost walls went deeper and a dirt basement was excavated as a convenient location for the water pump, furnace, oil tank, coal bin, electric panel, cistern, etc.

In the 1960's and 1970's, basements were converted and made deeper to add additional space for rec-rooms and bedrooms.

In the 1980's and 1990's there was a drive to find solutions to indoor health problems as well as technical problems surrounding leaking basements.

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A typical current building method is to dig a shallow hole in the ground until you hit water (in some cases this maybe 1-2 feet), then build a concrete box in this hole with small windows, then build a hill around it, on top of which you build your house. This provides a dark, damp, leaky area to store stuff you never use.

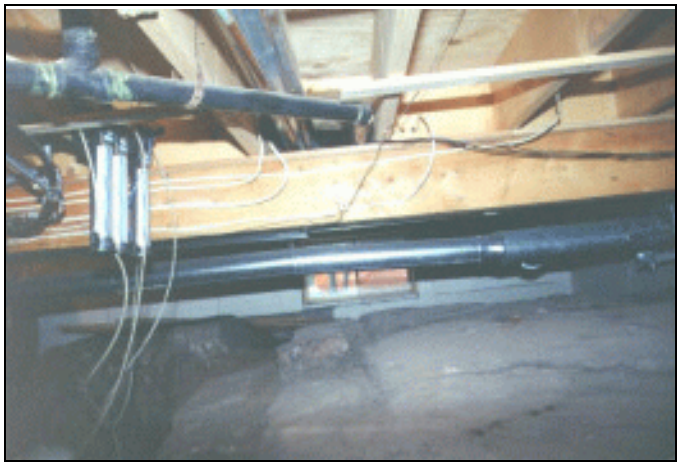
Figures 2 and 3: Current homes are typically built with underground concrete basements resulting in small windows and dark, damp, unhealthy living areas

Attempting to make a basement area liveable involves careful steps to try to alleviate the dampness and provide a conditioned space underground

What is the difference between a basement and a swimming pool - nothing - one tries to keep water out while the other to keep water in. Looking at it in this light, basements suddenly seem very unnatural.

Basements are Unnatural

Building underground is unnatural. There is a great deal of work that can go into making a living space underground into a habitable area. There is damp proofing, the use of preserved wood to combat rot, and complicated ventilation system to remove moisture. In the end, you never really make it the same as the upper living area. It is subject to floods if natural drainage is not available; you end up using this area to store junk; it becomes a breeding ground for mould and mildew; and it can be expensive if excavation runs into rock so that you either blast to remove the rock, or you end up building a basement crawl space. There is the need to de-water mechanically in rural areas. In short, building underground requires a great deal of work to make a naturally uninhabitable area somewhat liveable.



Figures 4: Basement built into rock

The Natural Way to Build

The natural way is to build on the top of the ground. You are not susceptible to flooding, there is lots of available natural light, there are no special details to ensure comfortable climate - it happens naturally! There is a simple excavation, which is to simply strip topsoil, lay down a flat bed of gravel and build a raft foundation. Storage can be of moderate size and planned to be on an upper floor and even over the garage as an unheated area if footprint space is at a premium.

Additional Benefits of Building Above Ground With Slab-On-Grade

Raft foundations, or slab-on-grade foundations, are better for poor soil capacity, since the soil bearing pressure is very low as the load is evenly spread out. Thus it is not a problem to build in poor soil conditions, and so you can use land that would otherwise be expensive to build on (or build in, as the case may be). In addition, excavation costs are reduced, since frost walls are not required. An inexpensive dozer is typically used to strip the topsoil, instead of digging with a hi-hoe or other expensive equipment. Backfill costs are reduced, since the only backfill is basically landscaping around the slab edge. Footing costs are eliminated, frost wall costs are eliminated, footing drainage costs are reduced, and sump pump costs are eliminated, all without having to worry about flooding.

LEGALETT Frost-Protected Slab-on-Grade

LEGALETT Canada is a company that supplies the materials and designs for frost protected radiant-heated slab-on-grade foundations. The LEGALETT foundation is an 8" thick insulated slab on grade design. This thick slab contains a network of closed loop air ducts that circulate warm air from integral heat distribution boxes in the slab. This warm air heats the slab, which provides a warm floor that radiantly heats the home. The slab is designed

specifically to prevent frost penetration below the slab. The dried out slab provides a comfortable indoor climate that is mold and mildew free.

The Easy Way to Build Slab-on-Grade

LEGALETT is a very simple slab to install compared to other types of slab-on-grade foundation designs. Other designs use a thickened edge slab system, requiring complex form work. LEGALETT uses a very simple constant depth slab, with stay in place form work.

Pre-engineered Heated Slab-On-Grade Systems:

Slab-on-grade designs are not within the scope of Part 9 (general residential construction) of the building code, and fall under Part 4 instead, which requires the design of an engineer. LEGALETT includes the structural design of the slab with the system, so no additional engineering is required.

In summary, once you realize that building underground is unnatural, then a heated-slab on-grade foundation is truly the way to build the foundation for your home - from the ground up!

Visit the LEGALETT web site at www.legalett.ca.

Figure 5: Homes built with a LEGALETT foundation have lower levels which are mold and mildew-free, and have lots of natural sunlight