



## POST-TENSIONING FOR RESIDENTIAL FOUNDATIONS

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"Our Company has been building affordable homes for four generations, since 1949. For 29 years, we have chosen to use post-tensioned foundations because of the value proposition it offers. Post-tensioning gives us high quality at an economical price."

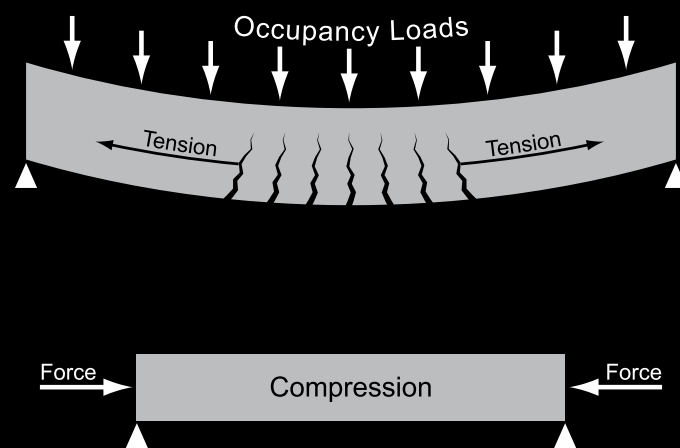
– B. Nelson Mitchell, Jr.,  
President, History Maker Homes

"The Post-Tensioning Institute has been one of the leaders in the development of procedures for slabs-on-ground on shrink-swell soils. Post-tensioning is a proven technology for bridges and buildings. For slabs-on-ground, post-tensioning – when designed and constructed properly – can increase the moment capacity of the slab and minimize the amount of cracking in the slab, thereby increasing the slab stiffness."

– Jean-Louis Briaud, PhD, PE,  
Professor and Holder of the Buchanan Chair, Zachry  
Department of Civil Engineering, Texas A&M University



## WHAT IS POST-TENSIONING?



Today's residential construction market is as competitive as it has ever been. Designers, engineers, builders and homeowners alike feel the pressure to control costs – yet not at the expense of high-level performance. This challenge has been met through the integration of post-tensioned foundations. Post-tensioning has been used successfully in elevated structures and slab-on-ground foundations for many years.

For 30 years, the post-tensioning method has strengthened concrete on both small and large projects by means of high-strength steel strands or cables, typically referred to as tendons. Post-tensioning offers a perfect balance of two materials that complement each other. Concrete is strong in compression and relatively weak in tension. In contrast, post-tensioning steel has a very high tensile strength – more than three times that of common reinforcing bars. By combining the two, a foundation can resist both compressive and tensile forces caused by various loads, which results in a more efficient, durable concrete foundation.

- Stronger/More Efficient
- Minimizes and Controls Cracking
- Controls Deflections
- Faster Installation
- More Reliable
- Economical



## FEATURES / BENEFITS

## FOUNDATIONS ON SHRINK-SWELL SOILS



Post-tensioning has proven to be an efficient solution for problems associated with ground-supported residential foundations on shrink-swell soils. The compressive stresses resist the anticipated tension stresses induced by the soil movements, enhancing the performance over a non-prestressed foundation. Cost benefits are achieved by reductions in quantities of concrete, steel and excavations, which in turn reduce labor costs.

**Q: Is post-tensioning more expensive than other methods of reinforcement?**

A: No. In fact, post-tensioning is more economical due to reductions in material quantities and labor costs. And, because post-tensioning produces a more reliable concrete foundation, homeowners are more satisfied; therefore, builders save time and money not having to deal with foundation repair issues.

**Q: Is post-tensioning only for use in areas with shrink-swell soils?**

A: No. While post-tensioning reinforced foundations have become the standard method used on shrink-swell soils, post-tensioning offer other benefits for regions with other types of soils. For instance, post-tensioning can save labor and material expenses as it allows a foundation to be constructed in less time than other methods, which offers benefits for all regions.

**Q: What are other slab-on-ground applications for post-tensioning reinforcement?**

A: In addition to residential foundations, light commercial, heavy industrial and institutional foundations, as well as sports courts and pavements, all benefit from the enhanced performance and cost savings post-tensioning provides.



## POST-TENSIONING FAQ'S

## UNIFORM THICKNESS FOUNDATIONS



In less expansive soils, a uniform thickness foundation is utilized. Typical thickness ranges from 7.5 to 12 inches and any increases in material quantities are compensated by reductions in labor and equipment costs. Because of the elimination of stiffening ribs, these foundations can be constructed very rapidly, and both labor and equipment needed to dig the ribs and dispose of excavations are eliminated. This is a substantial benefit in sandy soils where trenches require shoring. Post-tensioned foundations are also used in areas with stable soils to reduce cracking, reduce or eliminate control joints, increase flexural capacity and improve constructability. Reducing the control joints also improves the serviceability and eliminates durability problems.