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RPS TECHNICAL BRIEF
WATER · PRESOAKING
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ELIMINATING PRESOAK ON EXPANSIVE SOILS

The RPS Foundation Forming System: a solution to the issues surrounding presoaking pads on expansive soils

By Jim Winslow

I have been a developer and contractor since 1983, and during that time have been involved in every aspect of the construction of hundreds of single family, multi family, and light commercial structures from the grade up. One of the biggest issues during my 40 years in the industry has been, and continues to be, the use of water in construction, and especially the task of presoaking a foundation pad built on expansive soils. Even in cycles of non drought (periods becoming rare across the west and southwest), the economic cost of not only the water used but related items like additional cycle time for the foundation and longer carrying costs are large and often tense issues to deal with.

WHERE THE WATER IS USED DURING BUILDING

When building on expansive soils, and for the purpose of this paper I will confine my comments to that soils condition, a contractor moves from grading the pad to some depth of over excavation and recompaction. After that, the presoaking begins, and depending on engineering requirements, often entails that thousands of gallons of water will be used to cause pre swelling of the soils, with the idea that further expansion pressures on the new foundation will be minimized.

The following is a snapshot of the volume of water necessary to presoak a pad in preparation for construction of a basic foundation of new single family unit built on expansive soils across the western and southwestern USA in 2026:

PRESOAK DEPTH	1,000 SF	1,500 SF	2,000 SF	2,500 SF	3,000 SF
30 in	10,022	14,770	18,740	22,232	25,092
24 in	8,018	11,816	14,992	17,786	20,074
18 in	6,013	8,862	11,224	13,339	15,055
12 in	4,009	5,908	7,496	8,893	10,037
6 in	2,004	2,954	3,748	4,436	5,018

Gallons used to presoak. Inches used to presoak (rows) by foundation size (columns), western and southwestern USA, 2026.

Those are big sample numbers. However, they often get much bigger in actuality, as engineers usually require the presoaking to extend three to five feet beyond the pad perimeters in all directions to ensure the entire footprint is covered. This increases the area soaked by a factor of 1.5x to 2x the foundation size noted above.

Finally, and although the above table is focused on construction of single family pads, presoaking must also be done on multi family and commercial pads too. And, because of larger foundation loads of these structures, presoaking is often done to greater depths and even more water is used.

A BIG NUMBER ON THE AVERAGE

With today's building industry statistics pegging the average sized foundation for a single family residence across the western and southwestern USA at about 1,500 SF, and with engineers typically requiring 18 inch presoaking when foundations are constructed in areas of expansive soils (and even greater when existing water in the soils is more scarce, as when building is done in areas surrounded by agriculture), it's not uncommon that almost 9,000 gallons of water is used for the average sized single family home just in preparation of a building pad. And, for a multi family or larger light commercial pad, those numbers skyrocket to the hundreds of thousands of gallons, without accounting for the additional water used due to evaporation!

RPS SLABS: NO PRESOAKING REQUIRED

An RPS slab is created by connecting a series of RPS VBox units, 30 inch by 30 inch plastic forms that come in various heights and are set directly on a levelled subgrade. After the steel reinforcing is installed (RPS VBox units support both rebar and post tension cables), a monolithically poured top slab, usually 4 inches thick, is then placed. No separate footing pours are required. The monolithic pour creates concrete beams that run in both directions throughout the footprint. The completed mat sits on the ground like a raft, the void areas underneath the top slab formed by the placement of the boxes allowing for the movement of expansive soils.

An RPS slab possesses great stiffness that resists differential swelling resulting from landscaping practices, improper surface drainage, or flooding from any source. It does not require presoaking the underlying soils, and since the top of an RPS slab ranges from 14 inches to as high as 18 inches above grade, and is an active capillary break, it requires no gravel or sand, items that carry significant costs for not only the material itself, but in 2026, the transport and placement too.

~9,000 gal **PRESOAK WATER AVOIDED ON AN AVERAGE 1,500 SF HOME AT THE TYPICAL 18 INCH PRESOAK DEPTH. NO PRESOAKING REQUIRED.**

SUMMARY

For a 1,500 SF foundation built on expansive soils that requires 18 inches of soaking with other foundation systems, an RPS slab avoids almost 9,000 gallons of presoak water per home. Use of RPS on pads for multi family and light commercial structures would, because the presoaking is often done to greater depths and even more water used, provide even greater water savings for these structures.

This paper is presented for informational purposes to developers, engineers, and contractors by RPS, providers of the RPS foundation forming system. An RPS slab is a 5th generation on grade slab designed and engineered specifically for expansive, compressible, or rocky soils. RPS VBox slabs are reinforced with rebar or post tension and are designed by the project's Engineer of Record.

CONTACT

For more information on RPS foundations go to www.rps-usa.com or call Brian Cudd at (281) 923 6862.