A Developer's View of the Wafflemat ® Foundation System

By Jack Gafford, CEO, Century 22 Communities

The development strategy created by Century 22 Communities is based on the belief that a home, and its surrounding community, should be designed and constructed to last 100 years. In order to achieve the 100-year sustainability goal, C22C has gone to great lengths to analyze and re-design all the systems and components of a typical home to improve the reliability and reduce life-cycle cost.

When we applied our "re-thinking" process to the house foundation, the challenge was to find a better way to achieve sustainability regardless of soils conditions, as every builder knows a poorly designed foundation will eventually create major problems throughout the structure. Therefore, our 100-year house needed to have a "100-year foundation."

Two years ago, we began considering a large development opportunity in El Paso, Texas. El Paso is in an area having moderately expansive soil conditions, and we knew the traditional, and most common, solution for unstable soil conditions in the Southwest was to use a posttensioned ribbed slab. However, we also knew that post-tensioned ribbed foundations in the region have been experiencing many failures.

It was obvious our foundations would require upgrades in design, and that the traditional slab-on-grade approach would fall short of meeting our 100-year sustainability objective -- even though whatever new design approach we chose to improve upon the traditional foundation design method was bound to increase cost. However, we felt the additional cost was unavoidable if we were to achieve higher foundation reliability.

We reviewed the Wafflemat foundation-forming system distributed by Wafflemat Foundations. A post-tensioned Wafflemat foundation is designed to handle extremely expansive soil conditions. The "upside down egg crate" or "waffle" concept allows the foundation to resist uplifting caused by the movement of the underlying soils by providing "extra room." We concluded we would pay for this ***slightly more expensive approach*** because we would receive higher assurance our foundations would be sustainable, and meet our 100-year goal.

After working closely with Wafflemat Foundations to refine our design and produce detailed cost estimates, we came to an amazing discovery: A Wafflemat foundation not only improved our foundations, but also reduced our costs! How could something be better and cost less at the same time?

Comparing the total cost of a Wafflemat foundation to the cost of a traditional posttensioned ribbed foundation (the solution promoted by the Post-Tensioning Institute), we realized the additional, unanticipated savings described below:

General Earthwork - We performed far less earthwork to prepare the Wafflemat "pad." We also could ignore the need to remove poor soil, and then back-fill/recompact with imported soil.

Trenching for Footers - We eliminated trenching for footers in all but the most highly expansive soils.

Concrete - We reduced the amount of concrete required for the overall foundation by up to 35%.

Water and Sewer Underslab Feeds - We simplified the installation of buried utility lines under the foundation by eliminating deep footers.

When we tallied the ***total first cost*** of the Wafflemat foundation (taking into account all the savings in materials, labor, and equipment, and the added cost of the Waffleboxes), we concluded Wafflemat would not be more expensive. In fact, we concluded that in moderate to high production building situations, the Wafflemat system would usually cost less!

We worked out detailed cost estimates for a Wafflemat Post-Tensioned foundation, a Post Tensioned Ribbed foundation, and a Rebar-Reinforced Ribbed foundation of the same size (2,200 sf) and same structural strength. Compared to the Wafflemat Post-Tensioned foundation, the Post Tensioned Ribbed foundation had a 12% higher cost, and the Rebar- Reinforced Ribbed foundation a 24% higher cost.

A cost comparison (relative to the El Paso area) is shown in the table below:

	Materials	Labor	Equipment	Total
Wafflemat PT	$ 9,400	$ 2,250	$ 450	$ 12,100
PT-Ribbed	$ 7,150	$ 4,400	$ 2,050	$ 13,600
Rebar-Ribbed	$ 8,250	$ 4,800	$ 2,050	$ 15,100

In summary, the Wafflemat had a slightly higher material cost (due to the cost of the Waffleboxes), but also had significantly lower labor and equipment costs (due to reduced general earthwork, reduced pad preparation, and reduced trenching). In addition, the design of the Wafflemat foundation allowed for a

simplified, high-level quality control approach during construction, thereby allowing us to meet our 100-year foundation goal.

From a developer's perspective, the bottom line is that Wafflemat saves money and produces a superior life-cycle cost outcome. Even in low-production situations, we conclude the Wafflemat foundation breaks even when considering "first cost," and still yields a superior lifecycle cost. The long-term bonus delivered by Wafflemat is the reduced chance of foundation movement and cracking. This is more than just "frosting on the cake." This is a life cycle, cost savings bonus, and an often-overlooked, long-term operational risk reduction.

Wafflemat is the foundation system of choice for Century 22 Communities because it is 100-year sustainable. Wafflemat costs less, out-performs the competition well beyond the warranty protection period, and is simple to install.

To learn more, please visit Wafflemat.com or call 925.683.2739.

Jack Gafford currently serves as CEO of Century 22 Communities. C22C develops Net Zero Water, Energy, and Waste communities. He has been the project director and financial strategist for the McGuire AFB-Fort Dix military housing privatization project in New Jersey, the largest Air Force military housing privatization effort in the country. Mr. Gafford holds a Bachelors degree from the United States Military Academy at West Point and a Masters degree from the Naval Postgraduate School.