

Tensor InterAx™ Geogrid

Floor Slab Support For Warehouses And Distribution Centers With Geogrid Stabilized Rafts

New warehouses, distribution centers, and data centers often apply heavy floor slab loads to sites with soft and compressible soils. Ground improvement, such as Geopier® Rammed Aggregate Pier® systems or rigid inclusions are thus often used to stabilize the compressible materials to increase bearing capacity and control settlements. These elements are separated from the floor slabs using gravel pads that serve as a shear break and to transfer the slab loads to the stiff supporting elements (Figure 1). If the pad is not sufficiently thick, support is non-uniform resulting in excessive shear stresses and bending moment in the slab. Tensor InterAx geogrids are used to form a stabilized raft to strengthen the gravel pads and reduce slab structural stresses.

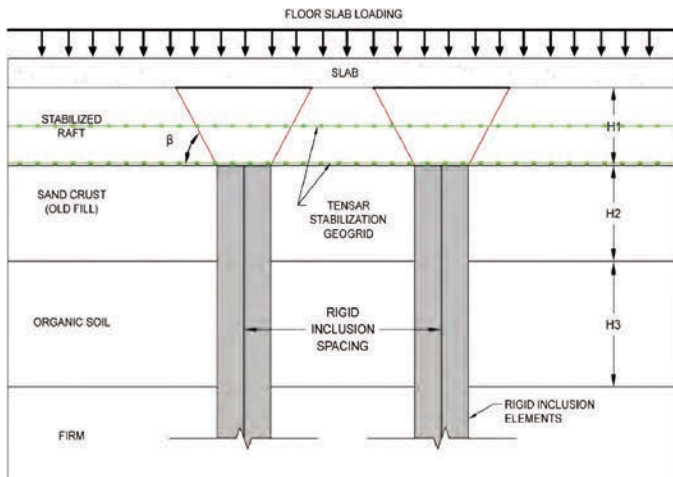


Figure 1 – Geogrid stabilized raft for floor slab support

Also, the stabilized raft provides a cost-effective construction platform over soft ground for heavy equipment during construction and mitigate the effect of differential settlement under floor slab from long-term repetitive loading. The stabilized raft improves the performance of the heavily loaded floor slab by:

- Increasing shear strength and stiffness of the gravel pad
- Limiting movement at floor slab joints
- Bridging across soil variability beneath the slab
- Increasing the bearing capacity of floor slab
- Protecting subgrade from deformation over time



InterAx Geogrid installation at distribution center

TENSAR® STABILIZED RAFT TECHNOLOGY

Tensor InterAx geogrids enhance the shear strength of the gravel pads by interlocking with the aggregate and creating a mechanically stabilized structure. The interlocking mechanism restricts the ability of the gravel to rotate and translate, which increases the dilatancy of the stone. This results in higher strength and ductility (Figure 2) which provides effective cohesion (Figure 3) based on large scale triaxial compression tests.

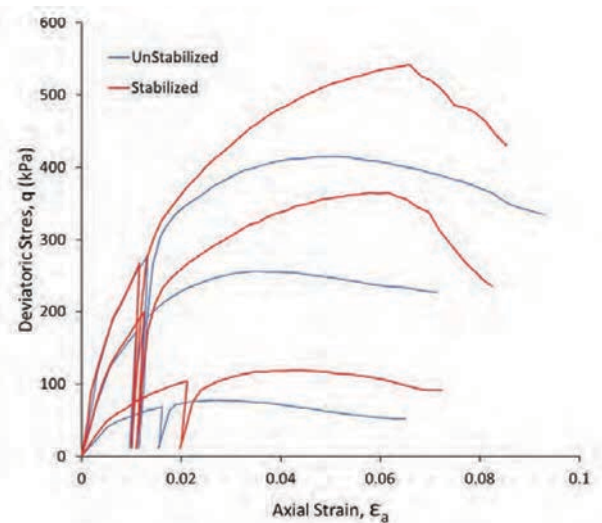


Figure 2: Enhanced deviatoric stress and ductility for mechanically stabilized gravel

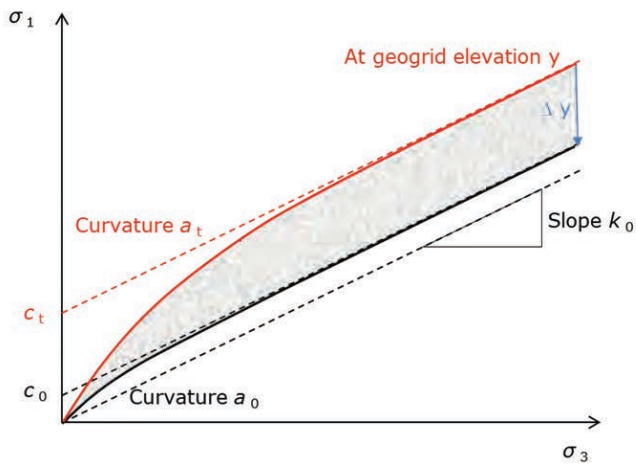


Figure 3: InterAx geogrid stabilized fill failure envelope

Through improved cohesion, an InterAx geogrid stabilized raft improves support to the floor slab and reduces relative shear stresses experienced in the foundation system during load transfer. The reduction in shear stress using an InterAx geogrid stabilized raft is shown using finite element analysis (FEA) in Figure 4.

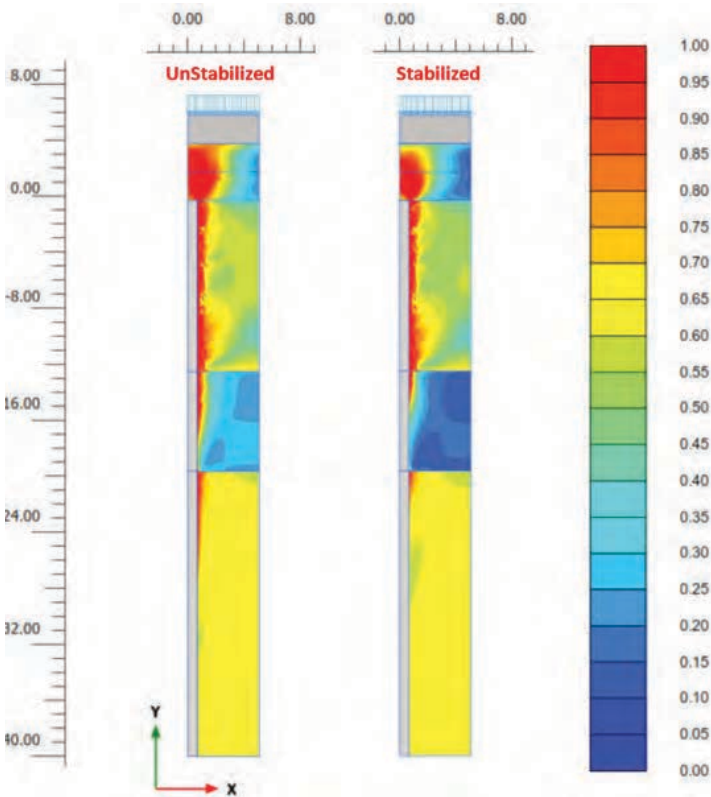


Figure 4: FEA modeling showing reduction in relative shear stress with a stabilized raft

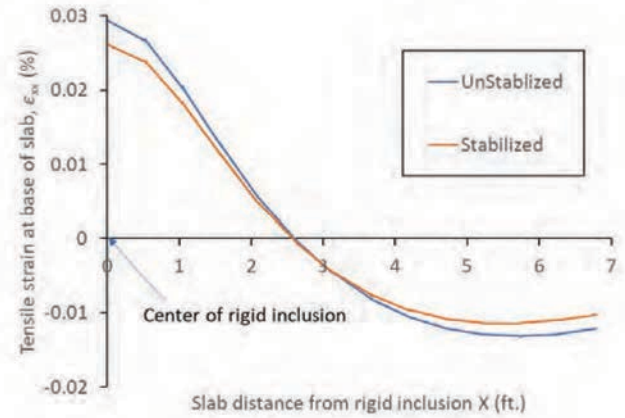


Figure 5: Reduction in floor slab tension with InterAx geogrid stabilized raft

STABILIZED RAFT GEOGRID LAYOUT

The first layer of InterAx geogrid shall be installed at the top of the rigid inclusion elements. InterAx FilterGrid™ may be used if separation is required between the subgrade soil and aggregate fill. One layer of InterAx geogrid is required for aggregate fill up to 18 inches thick. Multiple geogrid layers are required when aggregate fill thickness is greater than 18 inches. It is recommended that the InterAx geogrid be placed at a vertical spacing between 6 inches and 16 inches with the upper most geogrid layer being 6 inches below the bottom of the floor slab. Figure 6 presents a typical cross-section of an InterAx geogrid stabilized raft and overlap requirements.

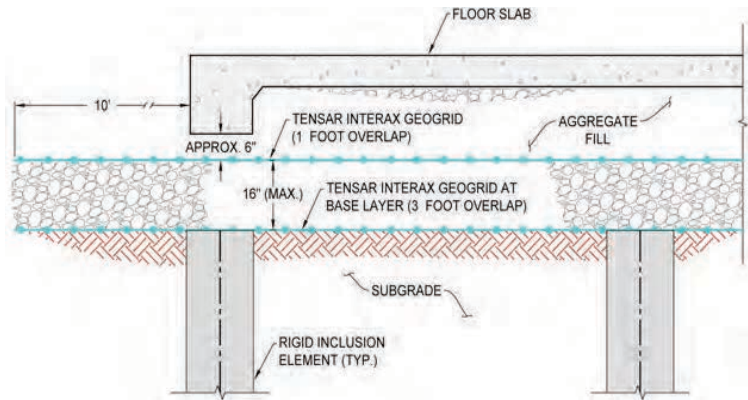


Figure 6: Typical section of InterAx geogrid stabilized raft

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A project is about more than a simple product choice – it's about the total value you receive from a partner committed to making your project a success. We can help you maximize budgets with proven strategies that create the highest performing structures often at lower cost.

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