

Phased Construction of Asphalt Pavements Incorporating Tensar® Geogrids Increases Road Performance

PHASED CONSTRUCTION

Phased construction has become a common practice in recent years – particularly in residential developments. In order to build a roadway to gain site access as quickly as possible, contractors initially place the aggregate component of the pavement and then, a thin asphalt layer on top. Once the overall site construction has been completed, the remaining asphalt is placed, ensuring a pleasant, clean finish to the road. This technique is particularly useful when local trenches are required for the installation of utility pipes and cables.



PERFORMANCE IMPLICATIONS

Pavement distress in the form of cracking at the surface of the asphalt, is common on roads within housing subdivisions. In many cases, these cracks start to appear within a very short period of time following construction – sometimes in as little as one or two years. Once the cracking starts to develop, the pavement's deterioration will accelerate very quickly. Pavement distress, as depicted by the "alligator cracking" shown in Photo 3 (below), is the most common deterioration, and is characteristic of a deep-seated problem within the pavement structure. In other words, a standard surface rehabilitation program will not be sufficient to overcome the problem and instead, the current owner of the road will face an expensive replacement of the road's foundation layers.

CAUSE OF PREMATURE PAVEMENT FAILURE

Consider the three pavement sections shown on the reverse side of this flyer (Figures 1–3). Based on the current method prescribed by The American Association of State Highway and Transportation Officials (AASHTO) for the design of flexible pavements, the allowable trafficking levels obtained for these pavement sections is shown in ESAL's above Figures 1 through 3.

Strange as it may sound, in this typical example, the implications of **leaving off the 1.5 in. of asphalt** surfacing during a phased construction procedure **results in an 80% reduction in the trafficking capacity of the pavement**. For subdivision-type roads however, the majority of heavy traffic is experienced during the construction of the surrounding housing and the road itself.

It is not surprising then, that when the asphalt surface layer is installed at the end of construction, the rest of the road is approaching the end of its design life. The placement of this thin surface layer results in some additional trafficking capacity, but after a year or two, the road will start to show surface distress – indicative of structural integrity problems associated with the lower layers.



Photo 1 – Subdivision road during construction.



Photo 2 – Condition of road at end of construction.



Photo 3 – Condition of road after 2 to 3 years.

Traffic Capacity = 55,000 ESAL's

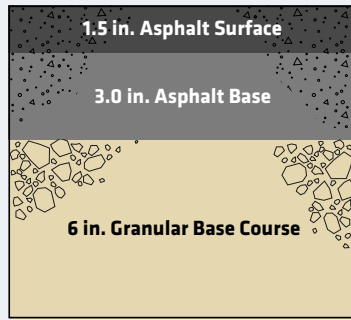


Fig. 1 – As Designed Section

Traffic Capacity = 10,000 ESAL's

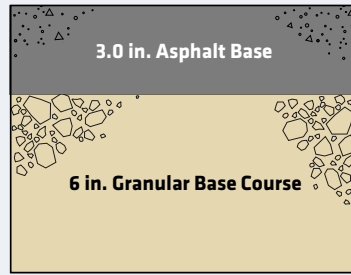


Fig. 2 – Actual Section during Construction*

Traffic Capacity = 60,000 ESAL's

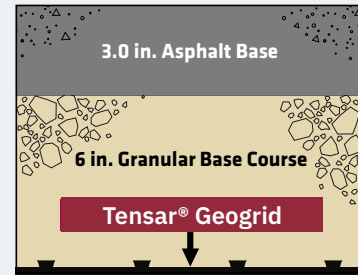


Fig. 3 – Tensor Geogrid Stabilized Section During Construction

*Leaving off the 1.5 in. of asphalt surfacing results in an 80% reduction in the trafficking capacity of the pavement.

THE SOLUTION

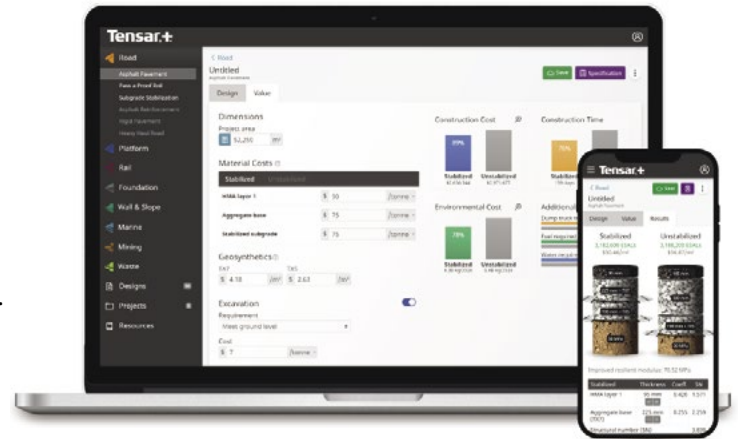
The performance benefits associated with the inclusion of Tensor® Geogrids within the aggregate base have been demonstrated and quantified through extensive research and project monitoring for more than 70 years. In this specific application, it can be demonstrated that the loss in trafficking capacity resulting from the absence of the asphalt surface layer during the critical construction period, is more than compensated for by the inclusion of a layer of Tensor® Geogrid within the pavement section. The bottom line — the long-term performance of the road is exactly as it was intended to be in the original pavement design.

EXPERIENCE YOU CAN RELY ON

Tensor International, the leader in geosynthetic soil reinforcement, offers a variety of solutions for foundation and roadway projects. Our products and technologies, backed by the most thorough quality assurance practices, are at the forefront of the industry. Our support services include site evaluation, design consulting and site construction assistance. For innovative solutions to your engineering challenges, rely on the experience, resources and expertise that have set the industry standard for more than two decades.

TENSAR+ DESIGN SOFTWARE

Tensor+ design software incorporates the benefits of Tensor geogrids into industry-accepted design methodologies. Based on rigorous fullscale testing, it provides specification generation along with educational resources to help users make more informed decisions. You can easily compare design alternatives, automatically generate a performance spec, calculate time, cost, carbon savings, and other sustainability metrics. Visit tensarplus.com to learn more and start designing today.



For more information on the Spectra System or other Tensor Systems, please call **800-TENSAR-1**, e-mail info@TensorCorp.com, or visit us online at www.TensorCorp.com.

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