

EFFECT OF REINFORCING SUBGRADE SOIL BY GEOGRID

Ninouh Tarek Salhi Sadok

Laboratory LGCA, University of Tebessa, Algeria

tninouh@hotmail.com, salhi.sadok@gmail.com

Keywords: Geogrid, Modeling, Pavement, Reinforcement, Subgrade.

ABSTRACT

A geogrid is geosynthetic material (polymer) used in civil engineering and public works (earthworks, road, railway, airport, retaining walls and extra-steep slopes).

Geogrids are a great solution to the strengthening and stabilization of infrastructure Projects, because they reduce largely, the formation of cracks and ruts in asphalt pavements. And they are very effective in soft and unstable soils.

Geogrids considerably reduce the cost of road project, capable of reducing the required thickness of granular material. They are designed to withstand short-term high dynamic loads (the trucks passing on the highway) or during longer periods of loads. The tensile strength is substantially equal in the longitudinal and transverse directions. Their geometry allows the particles to be caught in the meshes thus increasing soil reinforcement.

This research work deals with the numerical simulation of multilayer asphalt pavement structure under traffic loads. The subgrade of pavement reinforced with geogrids. The purpose of this reinforcement is to improve the bearing capacity of the subgrade. We used numerical simulations to analyze the process of improving the soil bearing carrier to reduce the thickness of the pavement layers. This decrease in thickness of the pavement layers will reduce the consumption of aggregates and also environmental protection.

REFERENCES

- [1] **AASHTO** «American Association of State Highway and Transportation Officials », 1993.
- [2] **Austin, D. N., and Coleman, D. M.**, “A field Evaluation of Geosynthetic-Reinforced Haul Roads Over Soft Foundation Soils,” Proceedings of the conference Geosynthetics, British Columbia, Canada, vol. 1, pp. 65-80, 1993..
- [3] **Bathurst R. J., Palmeira, E.M., Stevenson P.E., Tatsuoka F., Zornberg J.G.**, "Advances in Geosynthetics Materials and Applications for Soil Reinforcement and Environmental Protection Works". EJGE, 2008.



CESARE'17

*International Conference Coordinating Engineering for Sustainability and Resilience
Dead Sea, 3-8 May 2017*

- [4] **Burd, H. J., and Brocklehurst, C. J.** "Finite Element Studies of the Mechanics of Reinforced Unpaved Roads," Proceedings of the Fourth International Conference on Geotextiles, Geomembranes and Related Products, Balkema, Vol. 1, The Hague, Netherlands, pp. 217-221, 1990.
- [5] **BURMISTER D.M.** "The theory of the stress and displacements in layered systems and applications of design of airport runway". Proceeding of the Highway Research Board, 23. 1943,pp. 126-148.
- [6] **Christopher B. R., Holtz R.D., Ryan R.B.,** "Geosynthetics in roadways and pavements", Geosynthetic-Design-and-Construction-Guideline, FHWA HI-095-038 ,Revised April 1998, Washington, p167-202.
- [7] **Collin, J.G., Kinney, T.C. and Fu, X.,** "Full Scale Highway Load Test of Flexible Pavement Systems With Geogrid Reinforced Base Courses", Geosynthetics International, Vol. 3, No. 4, pp. 537-549, 1996.
- [8] **ELABD A.; HORNYCH P. ; BRAYSSE D.; DENIS A.; GHAZALLON C. A** "simplified method of prediction of pavement deformations of unbound pavement layers." 6th International Symposium on Pavement Unbound. 2004.
- [9] **Gabr, M.,** "Cyclic plate loading tests on geogrid reinforced roads." Research Rep. to Tensar Earth Technologies, Inc., NC State Univ, 2001.
- [10] **Holtz R.D.,** "Geosynthetics for soil reinforcement" 9th Spencer J. Buchanan Lecture, University of Washington Department of Civil & Environmental Engineering, November 2001.
- [11] **LCPC–SETRA** "Conception et dimensionnement des structures de chaussée, guide technique", Paris, Décembre 1994.
- [12] **PLAXIS V8.Material_Models_Manual_V8 .;** DELFT 2003.

*CESARE'17 – An International Conferer
coorganised by the Schools of Engineer
of Jordan University of Science and Technology (JUST), the
Thessaloniki (AUTH) and the University of Birmi*

