Case Study

Background
The Athabasca Oil Sands Project in Alberta, Canada was a joint venture of Shell, Chevron Texaco, and Western Oil Sands. At the time, it was one of the largest construction projects on the planet, and the latest fully integrated oil sands development in 25 years. With so many supplies, resources, and equipment needed to be delivered on a daily basis, the importance of a safe, dependable, and enduring airstrip was of number one concern. In addition, the soils in the AOSP are very prone to frost heave and the completed airstrip needed to be able to provide daily landings of the high loads of commercial aircraft such as Boeing’s 737 and Airbus A320.

Solution
To help meet these difficult design challenges, the engineer, owner and contractor needed a subsurface drainage solution capable of performing under the 125,000lb wheel loads from the aircraft. To address the frost heave, a capillary break was needed to prevent upward migration of the high ground water into the structural layers of the pavement. GSE RoaDrain drainage geocomposite was selected because of its engineered triplanar structure, long-term proven performance, and its capability in solving high water table and silty sand subgrade conditions. GSE RoaDrain benefits were immediately obvious as it allowed for fast removable of water from the pavement structure, and provided excellent compressive stiffness to support the high loads. Furthermore, RoaDrain provides enough void between the high water table below and the frost susceptible soils placed above, to function as an excellent capillary break. It provides separation of the subgrade and base material while also adding strength to the pavement structure. Installing GSE RoaDrain helped keep the project on track to finish ahead of schedule and below budget.
GSE RoaDrain Provides a Capillary Break
Water can rise into untreated aggregate courses from underlying ground water either in liquid form under capillary forces or as water vapor. Water entering the pavement structure in either forms will usually rise until reaching an impervious layer where, unless drained away, it will accumulate. A Capillary Break prevents the upward migration of liquid water or water vapor into the structural base layers. RoaDrain’s triplanar structure provides sufficient void to breaks the capillary path. This stops the upward migration of liquid water and allows evaporation of water vapor, preventing either form accumulating in the structural base layers. Including a capillary break into the AOSP airstrip project allowed the owners and contractor to take advantage of onsite soils eliminating expensive and time consuming hauls for imported materials.

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North America 800.435.2008
Europe & Africa 49.40.767420
Asia Pacific 66.2.937.0091
South America 56.2.595.4200
Middle East 20.23828.8888

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