Technical Paper

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FABRICS SUPPORT ROADWAY CONSTRUCTION IN TIDAL AND PEATY AREAS IN SOUTHWEST FLORIDA – A CASE HISTORY

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ABSTRACT

Construction of a two lane internal roadway for a residential subdivision in Marco Island, Florida, USA incorporated severed boundary conditions such low tidal land and required a remedy for shallow peaty-clayey subsoils as well as fluctuating water table. The roadway area was cleared of heavy underbrush and filled with dredged material from the adjacent canal. Cone penetration test (CPT) and standard test borings (SPT) performed along the proposed roadway alignment indicated that approximately ninety (90) percent of the roadway was underlain by compressible silty peat and organic silts.

Following a detailed evaluation of subsoil data and the various options available for support of the flexible roadway, a two layer system was designed. It was concluded that the two layer system consisting of geotextile/geogrid and a second geotextile, if incorporated in the pavement section, would alleviate the fluctuating water table, provide functional separation, and extend the life of this internal roadway, thereby reducing major maintenance costs that are normally associated with roadways in traditionally high water table areas. In addition, the first layer of stabilizing fabric with geogrid provided reinforcement and alleviated the deformation resulting from deficient subgrade and shallow compressible subsoils.

As part of the design and construction process, guideline specification and installation procedure were prepared on behalf of the owner. In addition, a laydown monitoring the supervised quality control program was provided by the engineering consultant and proved to be a key to the successful performance of soil-fabric interaction phenomenon. The adoption of a two layer system provided an efficient way of controlling stability and reducing the thickness of base and subbase material for the roadway pavement. It also resulted in a relatively higher structural number for the flexible pavement. Roadoway was completed in early 1992 and has since been carrying the traffic volume and loads. In addition, a recent reconnaissance has confirmed that the road is in excellent condition.

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