

PROJECT BRIEF

Indian River Inlet Foundation Assessment

PROJECT PROFILE

CLIENT:
Delaware Department of
Transportation (DeDOT)

LOCATION:
Sussex County, DE

VALUE:

- Predicted magnitudes and rates of movement over a 5-7 year period enabled informed decision making

SERVICES PROVIDED:

- Assessment of foundation conditions
- Predictions of overall movement

“Geocomp concluded that 40-50% of the total observed vertical movements were attributable to undrained deformations in the soft clay. The remainder was consolidation settlement.”



FOUNDATION CONDITIONS & NUMERICAL ANALYSIS

Geocomp was retained to conduct an independent assessment of foundation conditions and performance of the approach fills, and advise DeDOT on anticipated future performance. Geocomp conducted a detailed field investigation and comprehensive laboratory soil testing program to determine pertinent engineering properties of the soft clay deposit. Engineering analyses were performed to arrive at realistic predictions of consolidation and gain in strength of the soft foundation soils, as a function of time and loading history, in order to properly assess foundation stability. Plastic analysis, using numerical models (Plaxis), was conducted to assess the impact of approach fill loading on the very soft foundation soils with respect to short-term deformation, including lateral squeeze and long term creep. Geocomp concluded that 40 to 50% of the total observed vertical movements were attributable to undrained deformations in the soft clay. The remainder was consolidation settlement.



BACKGROUND

The Indian River Inlet Bridge provides a critical link on the Eastern seaboard between Bethany Beach and Dewey Beach, Delaware. Due to severe scouring conditions experienced in the inlet adjacent to the bridge foundations, the bridge needed to be replaced with a new structure that has a main span of approximately 1,000-ft/305-m. This longer main span allows the bridge to cross the inlet without any piers in the water and provides for future potential widening. The approach embankments and associated MSE walls (max. 40-ft/12-m-high) were constructed during spring 2006 through early 2007. Prior to construction, closely spaced 80-ft/24-m-long prefabricated vertical drains (PVDs) were installed beneath the embankment/MSE wall footprint areas to accelerate consolidation and strength gain of soft clay foundations soils.