

PROJECT PROFILE

AIRPORT RUNWAY EMBANKMENT SETTLEMENT MONITORING

Plans for a runway extension at Broome County Municipal Airport near Binghamton, NY involved construction of a 2,000-foot-long, 60-foot-high soil and rockfill embankment. Portions of the foundation materials that would support the embankment had a layer of compressible, organic peat ranging in thickness from 3 to 10 feet. Due to the depth of the peat below ground surface, the cost for its removal was prohibitive. Therefore the owner and designer decided to construct the embankment over



Runway extension at Broome County Airport near Binghamton, New York.

the peat and allow the weight of the fill to consolidate the organic foundation soils. This led to a need for monitoring the embankment settlements and pore water pressures in the foundation soils to:

- Permit evaluation of embankment slope and foundation stability during fill placement
- Determine when consolidation of the peat and embankment settlements were complete so the runway pavement could be placed
- Establish the total quantities of fill placed to determine pay quantities for the earthwork contractor



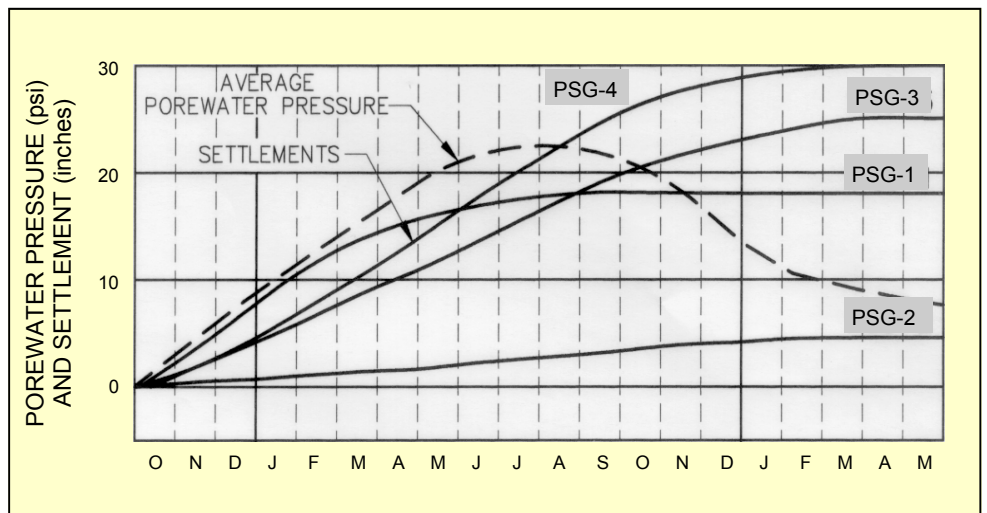
Runway extension fill viewed from adjacent highway.

D'Appolonia was retained to install and monitor various instruments and to make these engineering assessments during construction. The instruments installed included:

- Pneumatic settlement gages
- Settlement plates
- Pneumatic piezometers
- Slope movement monitoring monuments

As shown in the figure below, settlement of the fill and underlying peat

stopped approximately 12 months after fill placement ended. Observed settlements ranged from a few inches to more than 30 inches. The average settlement for the entire 30-acre area, most of which occurred during fill placement, was approximately 5 inches. This resulted in the need to place approximately 20,000 cubic yards of additional fill, for which the contractor was compensated. As shown in the figure, the high pore water pressures were fully dissipated approximately 28 months after the fill was completed.



Settlement vs. time for instrumented locations within fill at runway extension.