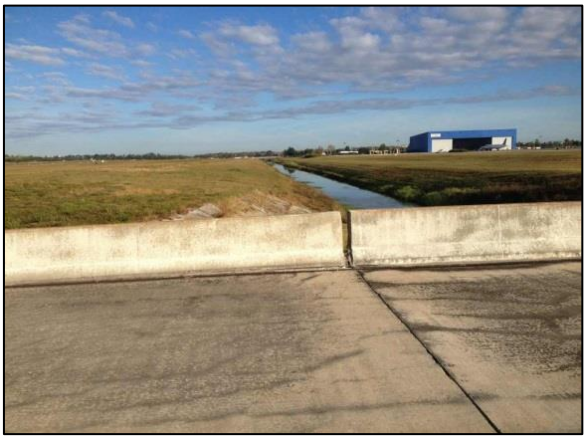
R J S E

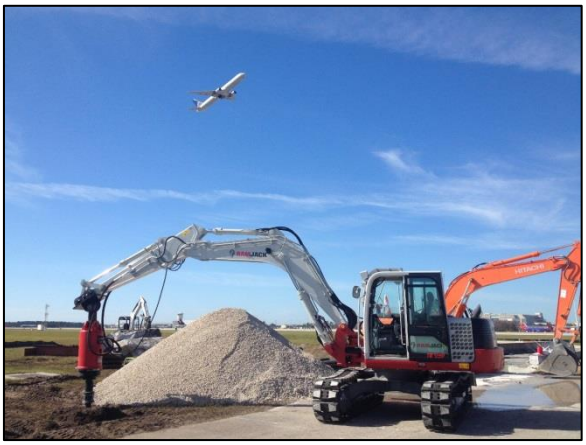
CASE STUDY

Orlando International Airport

Orlando, FL

Installer: Ram Jack of South Carolina • Ridgeway, SC • 866 735-3085



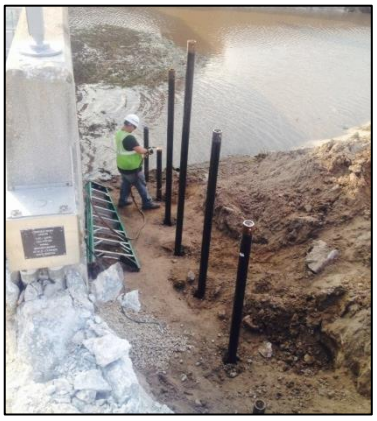


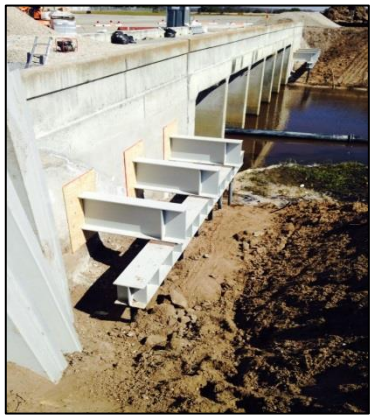
Situation:

Ram Jack of South Carolina was approached for remediation of a box culvert used as a taxiway bridge at Orlando International Airport immediately following a “Lunch and Learn” presentation at a well-known Florida engineering firm. The presentation had contained a brief case study of a prior installation of helical piles for remediation of flood water control structures in fast moving waters. The case study had piqued the interest of AVCON as they had been observing similar settlement of a large box culvert structure essential to flood water control at the Orlando International Airport. The massive culvert and abutment had been installed at least twenty years prior and had been observed in active settlement for the previous ten years. The settlement was now evident in the overlying taxiway and would require permanent closure if remediation could not be achieved. Soil boring data indicated very low blow count soils not well suited for any shallow foundation solution. The engineers requested further consultation with Ram Jack SC to develop a permanent deep foundation for remediation and support of this large structure and the substantial live loads encountered during daily operations and often compounded by flood waters.

Solution:

The engineers ultimately agreed upon a deep foundation solution consisting of 44 Ram Jack helical piles each configured in a 10”/12”/14” helix arrangement on a 3.5” pile shaft. These piles were to be installed at a depth and torque appropriate for an ultimate capacity of 84.4 kips in axial compression. Ram Jack arrived on site February 5th to begin installation of a load verification test pile in the area of anticipated work. The test pile was of the same 10”/12”/14” on a 3.5” pile shaft with a rock penetrating tip. The test pile achieved target installation torque at an embedment depth of approximately 94 ft; four reaction piles were also installed to facilitate a live load test of the pile. The following morning successful tension and compression load tests were performed in the presence of the Parsons Brinkerhoff engineers and relevant airport personnel. Work commenced February 7th and progressed at the rate of approximately 5 completed pile installations per day. The powered equipment required for this installation consisted of one Takeuchi TB1140 excavator equipped with a Pro-Dig V55K drive head and Pro-Dig Intelli-Tork wireless monitoring system. Additional equipment included two Bobcat mini-excavators used to facilitate preparatory soil work.





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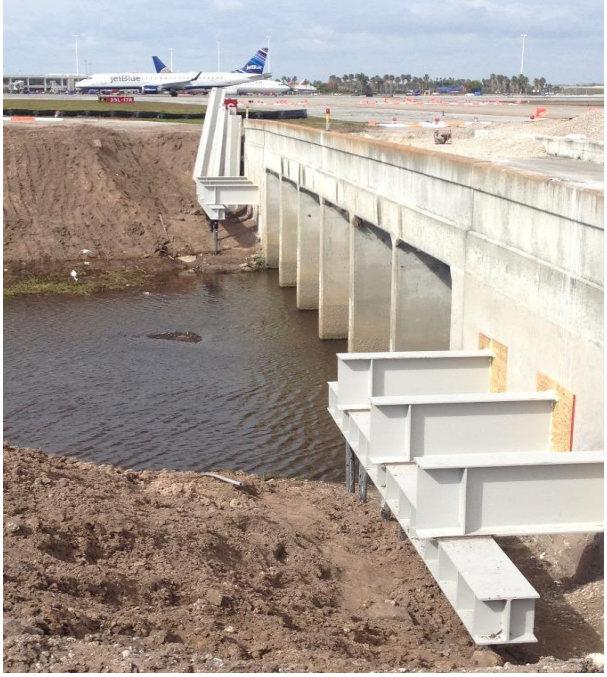
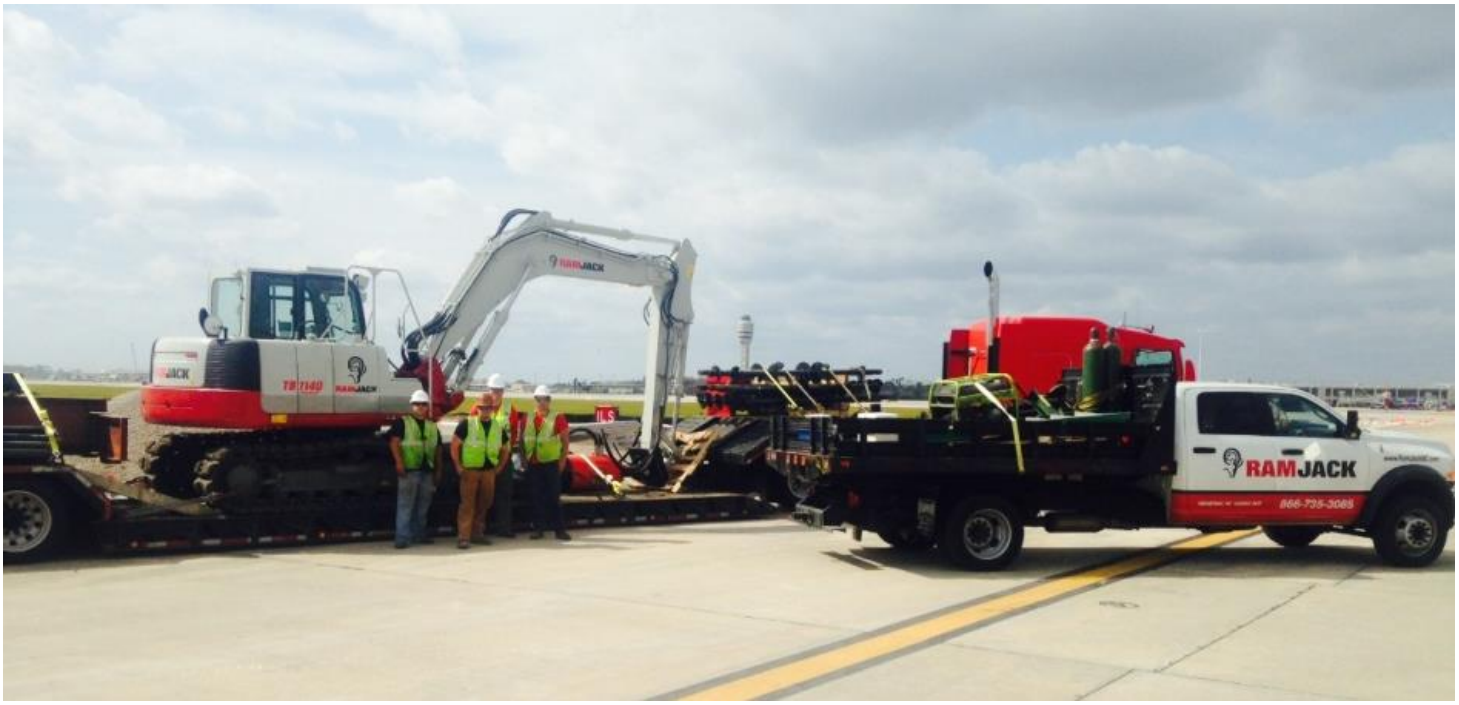
Conclusion:

Ram Jack of South Carolina completed the installation in a 10 working day period while contending with live airport operations in a very high security environment. Aircraft continued to operate uninterrupted at all times during work despite several challenging change orders and frequent site visits by the various agencies involved. The diligence of a dedicated and professional crew resulted in an immediate reopening of the taxiway and permanent support of the culvert structures for all future operations.





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