



MRCE performed a geotechnical review of the design of the foundations for the Atlantis Development, a resort on created land offshore in Dubai. At left: Satellite image of the palm-shaped artificial island.

Atlantis Resort Development (The Palms)

Palm Island, Dubai

Mueser Rutledge Consulting Engineers (MRCE) performed a geotechnical review of the design of the foundations for a resort near Jumeirah in the United Arab Emirates. The site is on a perimeter "crescent island" which surrounds an inner, palm-tree shaped island that connects to shore. The islands have been formed over the last three years by placing fill on the seabed in shallow water depth. The crescent island is 5 km in diameter and has a 250-m wide surface 4 m above sea level. The embankment forming the island has breakwater armoring on its exterior slope. The development will have a 20-story hotel with two levels of underground parking, a connecting two-story conference center, low rise retail space, and a water park. It will occupy a good part of the crescent island, with the hotel located on the central axis of the island. Larger structures will be supported on drilled piers, with the shafts passing through the fill and socketed into calcarenite bedrock below the original seabed. The dumped sand fill is being densified by vibro-compaction so that the lighter structures can be supported on spread footings sized to an allowable bearing pressure. Seismic shaking criteria recommended by the Arab Center for Engineering Studies (ACES) are UBC Zone 2A with a maximum bedrock acceleration of 0.15g from a magnitude 5 event, and a site classification of SC. MRCE's services included:

- review of suitability of design seismicity criteria proposed by ACES
- development of cone penetration test criteria for acceptance of vibro-compacted sand fill.
- review of drilled shaft capacities
- review of shallow foundation settlement
- analysis of pile load tests
- review of proposed foundation piling and vibro-compaction of hydraulic fill
- review of the May 2004 geotechnical site investigation report by the ACES
- identification of geotechnical tests and/or engineering recommendations
- preparation of a report giving our findings and recommendations