Located on the beach side of the main highway leading into Abu Dhabi from Dubai, the Al Raha Beach Development Project consists of eight precincts, on an area of 5.2 million square metres. These precincts will provide residential, commercial, cultural, entertainment and public facilities and will house up to 120,000 residents. Soletanche Bachy has been awarded the Design & Construct Contracts for the seawalls and ground improvement on the Eastern Precincts (Khor Al Raha & Al Bandar, Al Seef & Al Wateed).

**Diaphragm walls**
The quay walls and reclamation were designed to resist 100 year return period waves, mooring forces from large yachts. The diaphragm wall, which is generally designed to cantilever to support an excavation on the seaside, was also designed to cantilever in the opposite direction to support temporary excavations necessary to construct follow on works on the land side. A site specific seismic hazard assessment was made to determine the level of risk. Because of the extremely aggressive

| CLIENT: | ALDAR PROPERTIES PJSC |
| ENGINEER: | MAUNSELL CONSULTING |
| MAIN CONTRACTOR: | SOLETANCHE BACHY (LEADER) / NSCC JOINT VENTURE |

**MAIN QUANTITIES:**
- 20 km of cantilever diaphragm walls (1,000 & 1,200mm thick)
- 20 million m³ of ground improvement for the reclaimed land
- 20 km of Precast fascias (ongoing)
environment experienced by seawalls in the Middle East a
detailed assessment and prediction of the lifespan of the
reinforced concrete quay walls was made.
The client’s requirements for a design life of 100 years
were demonstrated to be met by an analysis of potential
chloride penetrations, measurements of the resistance of
the concrete to chloride penetration and appropriate mix
design and specification of minimum concrete cover and
quality control. Concrete with a 28 day cube strength of
45 MPa was used for the diaphragm walls, which are 1 m
to 1.2m thick, at a depth from 14 to 19m.
Diaphragm walls have been equipped with architectural
facing panels which go on the front of the quay wall and
provide an aesthetic finish to the exposed portion. The
precast facing panel is integrated with the diaphragm wall
capping beam.

Vibro compaction
The soils to be treated were largely carbonate sands. The
depth compaction by vibrocompaction was complemented
by surface compaction using impact rollers. The resulting
compacted ground profile is acceptance tested by cone
penetration tests and zone loading tests.

Resources
The human resources deployed went up to 50 expatriates
from France, Hong Kong, Philippines and 1,000 staff from
about 12 different nationalities.
The project mobilised 4 Hydrofraises, 3 KS hydraulic grabs,
2 mechanical grabs and 8 V23 Vibroflots.