

# Retaining structure

Geomix wall

## AXE LITTORAL PROJECT

MARSEILLE - FRANCE



### Construction of a Geomix retaining wall to allow the deviation of a sewer



Site overview

The aim of the Marseille Axe Littoral project was to construct a cut-and-cover tunnel to replace the motorway viaduct that runs along the port. A sewer running alongside the La Major esplanade had to be deviated between the cathedral complex and the diaphragm wall of the future tunnel. Soletanche Bachy built a Geomix retaining wall to allow excavation down to a depth of about 4.50m for the

CLIENT:	MPM (COMMUNAUTÉ URBAINE MARSEILLE PROVENCE MÉTROPOLE)
ENGINEER:	EGIS / ARCADIS / MASCARELLI JOINT VENTURE
CONTRATORS:	CAMPENON BERNARD / SPIE TPCI / GTM / SOLETANCHE BACHY / BOTTE JOINT VENTURE (GEOMIX WALL : 100% SOLETANCHE BACHY)
PERIOD OF WORKS:	2008 (1 MONTH)

#### MAIN QUANTITIES:

1 700m<sup>2</sup> of Geomix retaining wall

sewer to be deviated. The Geomix wall was built between the Tunnel de la Joliette's eastern diaphragm wall and the La Major cathedral. The Geomix technique was chosen due to its low cost and the need to protect the La Major cathedral, an important historical monument, against settlements.

**Geology**

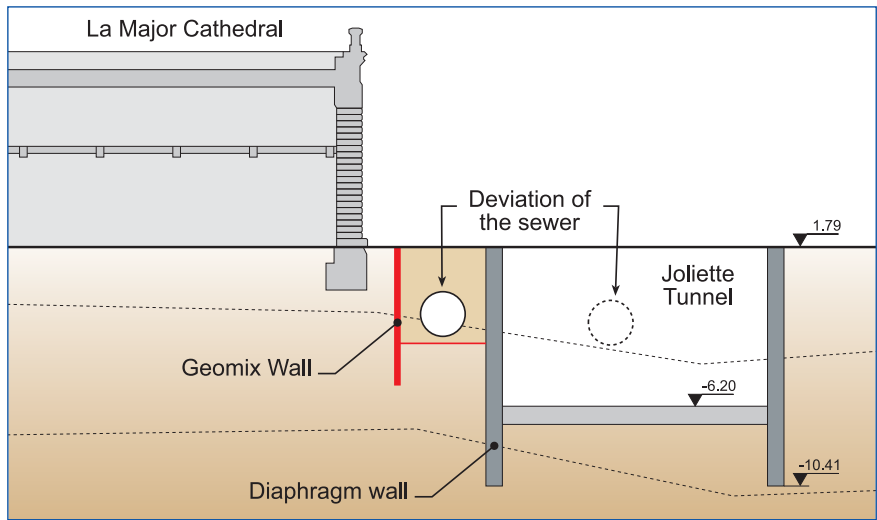
The retaining wall sector contained three geotechnical features:

- Gravel-cement mixture (clearing) from 0 - 2m,
- Marl or sand or silt (highly variable), between 2m and a varying depth of up to 8m,
- Puddingstone below.

The water table was at a depth of 2-3m.

**Wall design**

The wall was 800mm thick, 245m long and its depth varied between 6.00 and 8.00 metres. The wall included H beams placed 20cm from the earth moving side, at 1.50 meter intervals, with length geared to the site geology and the depth of the excavation.



*Cross-section view of the structure*

**CSM tools**

The CSM system (Cutter Soil Mixing) used for the job comprised a Kelly of 23m, mounted on a mast 24m high, with two hydraulic motors, each with torque of 5,000 daN.m and fitted with toothed drums. The system was mounted on a Liebherr LRB255 rig.

**Drilling**

The mixing plant excavated the soil at a speed that varied according to the compactness of the ground. The soil was disaggregated by the shear drums

and grout was simultaneously injected into the ground through a nozzle fitted between the shear drums. The resulting mixture constituted the wall. Water tightness between panels was achieved by the secondary panels biting into the primary panels, thereby forming a direct concrete-to-concrete joint.



< CSM rig



The Geomix wall > during earth moving work

R. Secco - Image In