

Diaphragm wall - Civil works

Grouting - Ground anchors - Prefounded columns

BAUDOYER CAR PARK

PARIS IV - FRANCE



Design and construction of 5-level 320 place underground car park

Baudoyer car park lies under Place Baudoyer between the municipal buildings and the barracks of the Republican Guard. When planning the excavation work, a number of constraints and engineering problems had to be considered:

- There had to be no disruption of the lives of nearby residents.
- Mature, leaning, closely-spaced trees had to be preserved intact.
- Hard ground would be encountered during excavation.
- The water table lays near the surface.



View of car park

A further requirement was to provide for an archaeological dig which eventually brought to light remnants of 8th century Merovingian dwellings and tombs from the 12th century Saint Jean cemetery containing skeletons in a remarkable state of preservation.

Description of works

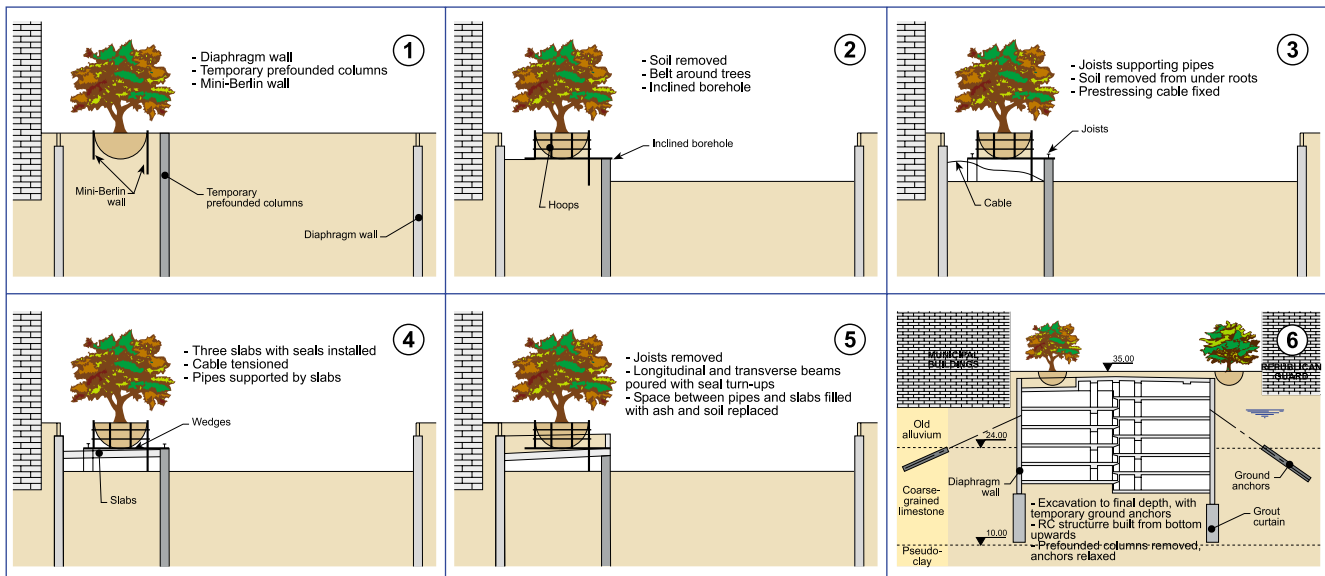
Construction procedure

The retaining wall around the excavation was a diaphragm wall, 0.63m thick. It was built with a Latine Hydrofraise rig, the best suited to trenching in hard ground (coarse-grained

ULTIMATE OWNER:	PARIS CITY COUNCIL
OPERATING FRANCHISEE:	REALPARK
EXECUTIVE AGENCY:	SOGEPROM
ENGINEER:	GAU3 / BETL GROUP
CONTRACTOR:	SOLETANCHE BACHY
CONSTRUCTION PERIOD:	SEPTEMBER 1993 - DECEMBER 1995

MAIN WORKS QUANTITIES:

- Diaphragm wall : 3080 m²
- Grout curtain : 1080 m³
- Prestressed ground anchors : 40 units
- Prefounded columns : 7 units
- Trees underpinned : 6 units
- Floors : 8000 m²
- Cover slab : 1600 m²
- Excavation : 23,000 m³



Sequence of work for "potting" trees

limestone) without damaging the branches of the trees, and keeping disturbances to residents from noise and vibration to a minimum.

A grout curtain extending from the toe of the diaphragm wall into the limestone controls underseepage during and after construction (the concrete raft is drained and seepage has to be pumped out).

Part of the retaining wall runs between the front of the municipal building and a row of closely-spaced old plane trees with widely-spreading branches, some of them leaning shar-

ply, for which a half-sphere of 2m radius had to be kept. Construction of the cover slab under the trees consisted of first installing temporary prefounded columns, removing the soil from around the trees inside a mini-Berlin wall, then drilling a subhorizontal support system consisting of three 109/127mm pipes spaced one metre apart over a width of 4 metres. The pipes rest on steel joists, supported on the prefounded columns at one end and on the ground at the other. Then precast concrete slabs were slipped under the pipes, supported on the diaphragm wall; lastly, a system of longitudinal and transverse beams was installed.



Latine Hydrofraise at work



"Potting" trees



Place Baudoyer during and after construction



The diaphragm wall is tied back with one row of temporary prestressed ground anchors during excavation to final depth, while the prefounded columns maintain the tree "pots" in position. The five staggered floors were then built from the bottom up.