

Urban excavation

Diaphragm wall - Micropiles - Grouting - Dewatering - Ground Anchors

CARRÉ ROYAL

RHEIMS - FRANCE



Facades underpinning and creating a new excavation within the perimeter of the former Galeries Rémoises



Patrice Lasue

Structural underpinning was carried out within the perimeter of the art-deco style facades of the former Galeries Rémoises

Located in the historical centre of Rheims, the Carré Royal project involves the construction of a housing and office block comprising 5 floors including the ground floor on the site of a Galeries Rémoises building erected in 1923. The project retains the art-deco style façade and includes the construction of a deep basement car park. Solétanche Bachy has been awarded the contract for the facades underpinning the construction of the

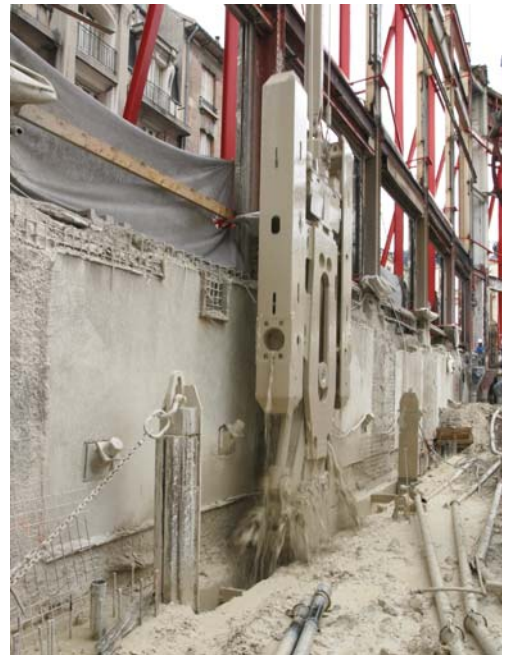
THE CLIENT:	SCI "LES DEUX POMMES D'OR" (PALM PROMOTION)
THE SUPERVISING ENGINEER:	PINGAT INGÉNIERIE
THE MAIN CONTRACTOR:	RABOT-DUTILLEUL
THE INSPECTION ORGANIZATION:	VERITAS
DURATION OF THE WORKS:	FEBRUARY TO NOVEMBER 2006

MAIN QUANTITIES:

- 46 type II micropiles, 10 and 11m deep
- 520m² of tied in sprayed concrete wall
- 2,440m² of diaphragm walls (0.50m wide and 12m deep)
- 2,070m² of injected zone below the wall (10m high)
- 4 pumping shafts
- 73 active ground anchors measuring an average of 16m in length



< Installing the ground anchors in the existing basement



The diaphragm wall > was excavated level with the facades using KS 3-2 grabs

Patrice Lague

diaphragm walls and ground anchors and also for a temporary dewatering system.

Works were carried out over several phases:

Phase 1: micro piles

Prior to demolition works, Solétanche Bachy was responsible for installing the micro piled foundations used to support the façade and a shotcrete anchored wall, build against the wall of the existing 1st basement level. Active ground anchors have been installed through the backfilled cellar levels and anchored into the chalk. This sprayed concrete wall has been designed to take the thrust applied by the ground once the ground floor has been demolished.

Phase 2: diaphragm wall and grouted cut-off

The archaeological remains located in line with the wall were surveyed by archaeologists and then, once the internal structure had been demolished, these remains were removed and the cellars that had been undermining the basement were backfilled in order to render the excavation works safe. The diaphragm wall was then constructed within the preserved facades and from a working platform provided by the existing basement. This wall will enclose the underground car park and the foundations of the future building.

A dewatering system was then installed to lower the groundwater while

the excavation works were carried out and the sealed floor cast. This system included a grouted cut-off under the foot of the diaphragm wall designed to increase the hydraulic cut-off, pumping wells and control piezometers. The grouted cut-off was constructed in several stages: the wall bonded followed by primary and secondary grouting phases into the chalk, through open bore holes using that which had been previously installed and left ready for use.

Phase 3: ground anchors

The prestressed ground anchors and corner struts were installed as the earthworks progressed.



The ground anchors were installed as the earthworks progressed

