

# Jet grouting

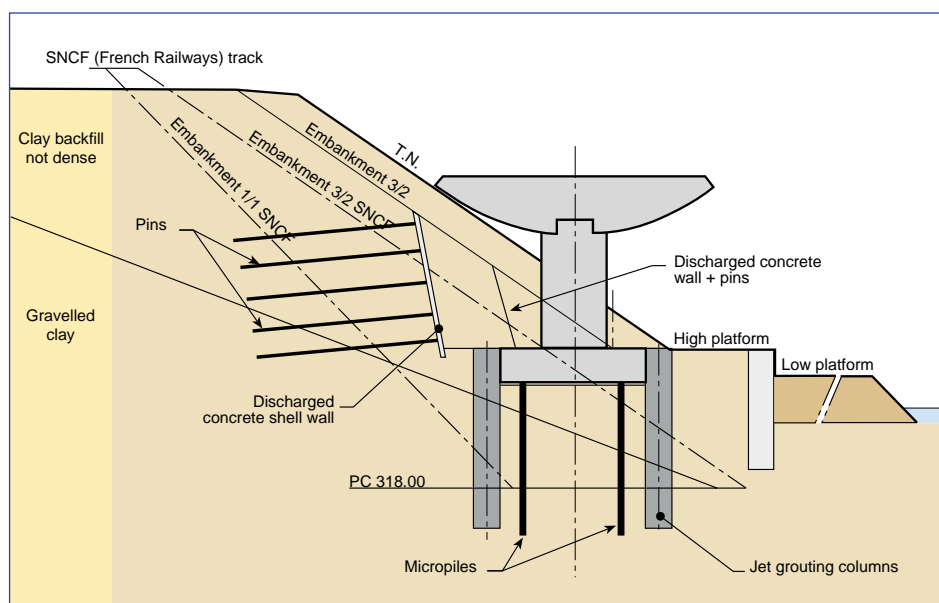
## TENAY VIADUCT - ARGIS-TENAY DIVERSION

AIN DEPARTMENT - FRANCE



### Building round protective excavation structures in order to protect a viaduct pile bedplate-micropile link

**B**etween Ambérieu-en-Bugey and Belley, national road 504 crosses the South of the Ain department, via "Cluse des Hôpitaux", a narrow valley cut by the River Albarine, in the limestone massif of the Jura. This route, also used by a railway line, is located on a main transalpine link with busy heavy goods vehicle traffic. At right angles from the little town of Tenay, the valley is particularly deep and installing a diversion requires building a viaduct with piles sunk into fallen rocks at the foot of limestone cliffs, to a depth below the river level.



Standard transverse section at right angles from a pile

In order to perform excavation for these foundations out of the water, a round protective cover using 80-cm diameter, double jet, overlapping columns, spaced out every 60 cm with a minimum of 20 bars resistance to ordinary compression was built from a riverside works platform.

In order to work out the parameters of the process to be used in the fallen rocks or alluvium with on-site blocks, 4 test columns, including 2 standing alone and 2 with a centre-to-centre distance between them of 60 cm, were produced and unearthed at the start of the works.

Two types of ground were found:

- raw fallen rocks,
- fallen rocks set in a clayey mould.

In both cases, the required diameter and resistance were easily found, and we could check that blocks present didn't have any major masking effect with columns spaced out every 60 cm, as long as, and taking into account the sometimes clayey nature of the mould, overlap-

ping columns were produced in a "fresh-in-fresh" sequence, if possible.

On this building site, Bachy also produced viaduct pile bedplate foundation micropiles, whose size was checked by a haulage test on a test micropile.

CLIENT:	FRENCH MINISTRY OF EQUIPMENT
GENERAL PARTNER:	" DDE DE L'AIN "
MAIN CONTRACTOR:	GTM
WORKS PERFORMED BY:	BACHY
WORKS PERIOD:	SEPTEMBER TO NOVEMBER 1994

#### WORKS PERFORMED

Producing 13 viaduct piles, with the following for each pile:

- 30 double jet columns at a depth of 6 to 8 m in a mass of fallen rocks
- 10 TM-type micropiles, weighing 10 tons, in limestone