

Madrid Metro (Spain)

TBM Excavation

Jet Grouting



Project:	“Metro Norte” Development. 1B package
Scope:	Soil improvement to prevent terrain settling produced by TBM excavation
Property:	CRTM (Consortio Regional de transportes de Madrid)
Client:	ACCIONA
Year:	Penfiente

Description:

The soil improvement treatment executed by Jet grouting type I, was carried out to avoid possible terrain settling brought about by the TBM ground excavation during the execution of the metro tunnel. For that reason, Jet grouting columns with inverted V shape, were deployed in almost the whole surface to be treated, the only modification applied being the inclination of the columns.

A number of tests were carried out prior to the execution of the works, to ensure that the appropriate parameters influenced by the ground conditions were taken into account.

The soil treatment was executed in a densely populated

area, with a large number of buildings and the presence of communication, electric, gas and sewerage networks, in some cases, coming up as close as 2 m from the ongoing works to the nearby buildings. These conditions brought about a special sensitivity towards possible settling of the surrounding terrain, therefore exhaustive topographic measuring and control were considered a key procedure.

Summary of site characteristics

- 20.085 lm Jet Grouting drills
- 14.225 lm Jet Grouting injection
- 0° to 43° Drill angle inclination
- 35 m Maximum drilling length
- 400 to 550 mm Diameter section



(1) FYM M (Spain) Madrid JG Linea 1B

