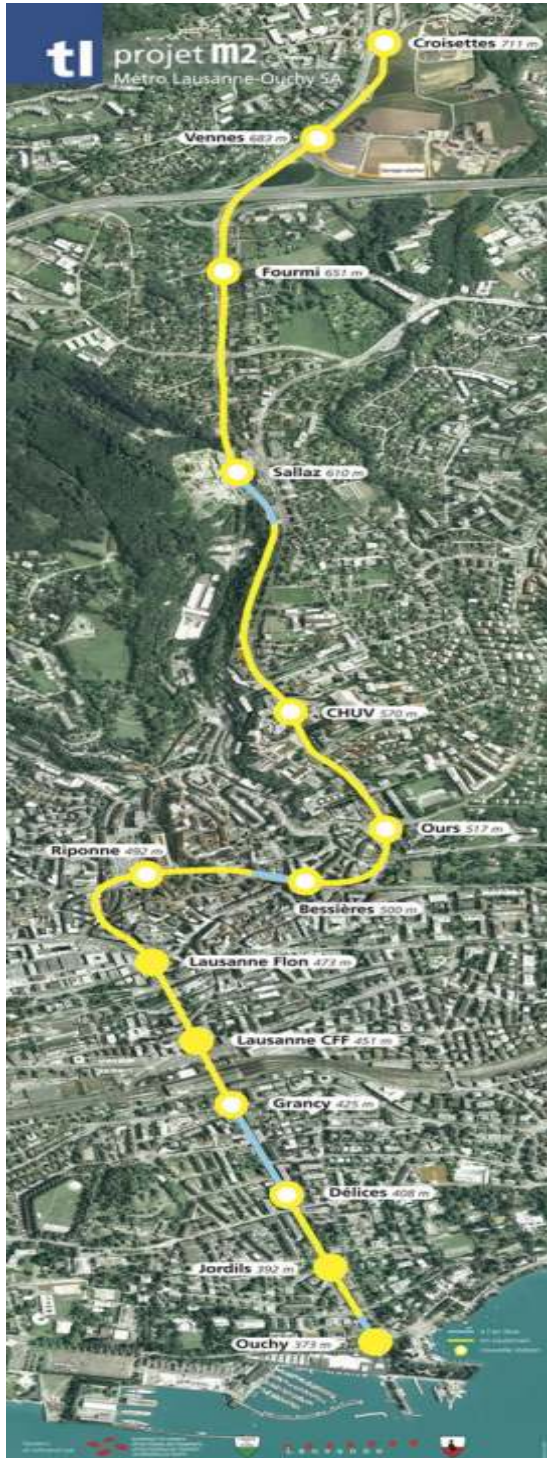


Steel Pipe Umbrellas Jet Grouting



PROJECT

METRO M2 LAUSANNE



PROJECT NAME

New M2 Lausanne Metro Line between Ouchy and Croisettes-Epalinges

CLIENT

Metro Lausanne Ouchy SA

ENGINEER

CEPT SA, Emch&Berger SA
GVH Tramelan SA, Piguët & Ass.

GENERAL CONTRACTOR

Lot 1200 Dénériaz/Zschokke L./Walo/Grisoni Z.
Lot 1300 Prader Losinger/ Dénériaz
Lot 1400 Prader L./Murer/ Dénériaz /Frutiger
Lot 1500 JPF/Induni/Evequoz-Getra
Lot 1700 Marti TB, Marti TS, Batigroup

SPECIALIST CONTRACTOR

RODIO Geotechnik AG

CONTRACT VALUE

EURO 4.8 Mio CHF 7.7 Mio

BEGINNING OF WORKS

June 2004

END OF WORKS

August 2006

■ JOB DESCRIPTION

The new Lausanne Metro line M2 has been constructed in a period comprised between June 2004 and August 2006. The new line from Ouchy to Croisettes-Epalinges, with slope inclinations of up to 12% (one of the world's steepest metro line) has a total length of 2.9 km. The nine lots saw both open cut and closed tunnels. Rodio was present in four of the nine lots and realized over 40,000 m of drill holes for soil improvement in form of steel pipes, jet grouting umbrellas and fiberglass anchors ahead of excavation's face. The difficult and very heterogeneous ground, consisting of loose layers of silty fine sand, moraine and rock-like molasses, presented together with the very thin coverage with presence of old buildings and crowded roads had been one of the major challenges of this project.



RODIO GmbH Spezialtiefbau
Siemensstraße 2a
D-86356 Neusäß
T +49 821 450 428 0
F +49 821 450 428 20
E-M admin@rodio.de
www.rodio.de



RODIO Geotechnik AG
In der Lübenzen 17 P.O. Box
CH-8902 Urdorf ZH
T +41 43 500 09 30
F +41 43 500 09 31
E-M admin@rodio.ch
www.rodio.ch



RODIO
SINCE 1921

Steel Pipe
Umbrellas
Jet Grouting

Steel Pipe Umbrellas Jet Grouting



PROJECT

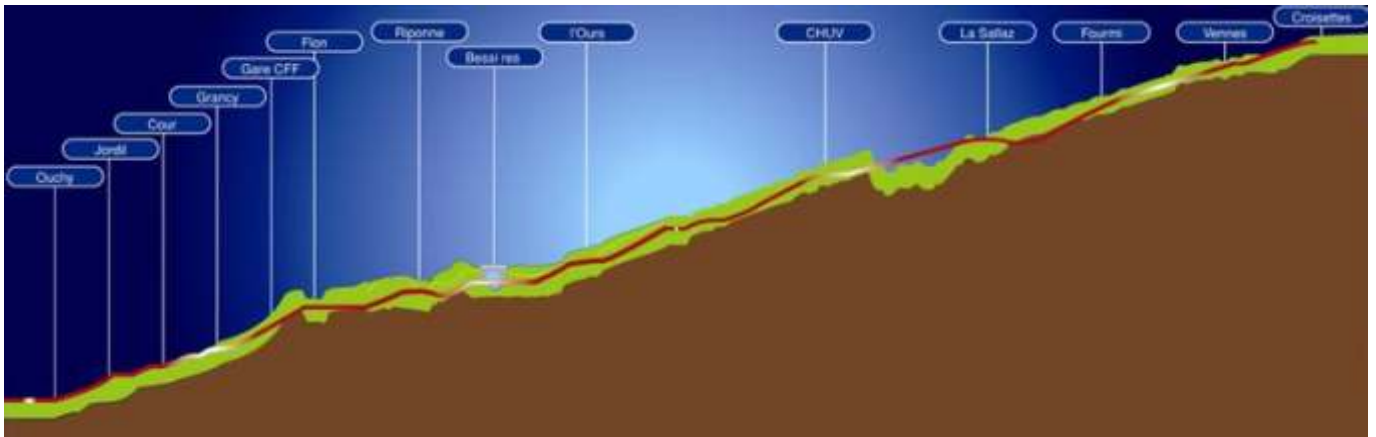
METRO M2 LAUSANNE

■ WORK QUANTITIES

19'000 m of steel pipe umbrellas
18'600 m jet grouting umbrellas
2.000 m Fiberglass Anchors

■ MAIN EQUIPMENT

Up to 3 **RODIO** SR510 Tunnel drill rigs
3 computerized full automatic MAT 13/15 mixing plants
1 ELENA grouting plant with 4 injection pumps
2 Metax MP7 high pressure triplex pumps
Recording of drilling and jet by means of LUTZ CL88 and LT3 systems



The steep route of the M2 metro line



RODIO SR510 drill rig inside the Lot 1300 tunnels



RODIO GmbH Spezialtiefbau
Siemensstraße 2a
D-86356 Neusäß
T +49 821 450 428 0
F +49 821 450 428 20
E-M admin@rodio.de
www.rodio.de



RODIO Geotechnik AG
In der Luberzen 17 P.O. Box
CH-8902 Urdorf ZH
T +41 43 500 09 30
F +41 43 500 09 31
E-M admin@rodio.ch
www.rodio.ch



RODIO
SINCE 1921

Steel Pipe
Umbrellas
Jet Grouting