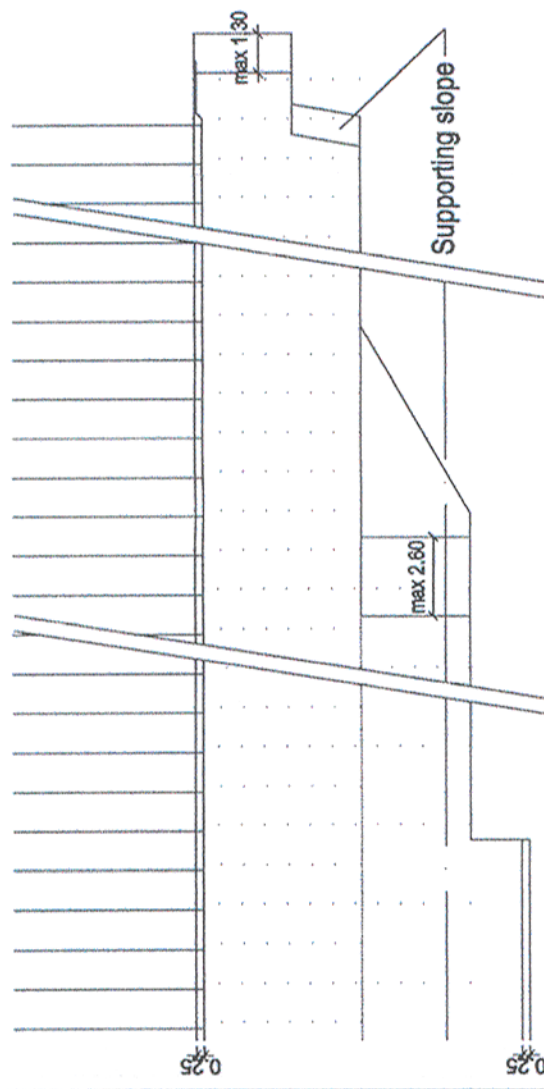


Execution M 1:250



Longitudinal section M 1:250

1. Crown
Excavation:
- Length of round max. 1,3 m
Reinforcement:
- Shotcrete sealing of the tunnel face after every tee
- Shotcrete after each round
- Steel fabric, mats, steel sets, girder, shotcrete after each round
- Systematic anchoring at second round behind heading after each round

2. Bench:
Excavation:
- Trailing max. 60 m behind Crown
- Length of round max. 2,6 m
- half side
Reinforcement:
- Steel fabric, mats, shotcrete after each round
- Every second steel set, girder is extended
- Systematic anchoring at second round behind heading after each round

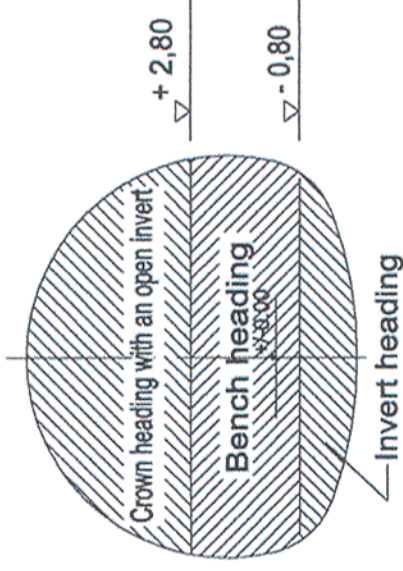
3. Invert:
Excavation:
- Trailing distance up to 100 m from the face of bench or according to measurement results
- Unsupported round length max. 10 m
Reinforcement:
- Steel fabric mats, shotcrete after each round

ORT	Term	UNIT	QUANTITY PER LFM TUNNEL
Crown	Excavation section	m ³	53,86
	Steel fabric mats Q 257, 2 Layers, A	m ²	36,25
	Steel sets, girder Typ 1, e=1,3 m	m	13,94
	Shotcrete da=25 cm	m ²	17,74
	Anchor l=6,0 m, SN/ISB, 200 kN	St	6,54
KI	Sealing shotcrete face 6 cm	m ²	30,00
	Spiles with injection drill bolt l=3,5 m	St	0,5
	Excavation section	m ³	0,5
	Shotcrete da=15 cm	m ²	0,5
	Steel fabric mats horizontal bars	kg	35,00
Bench	Excavation section	m ³	47,03
	Steel fabric mats Q 257, 2 Layer	m ²	14,83
	Steel sets, girder Type 1, e=2,6 m	m	2,85
	Shotcrete da=25 cm	m ²	7,44
	Anchor l=6,0 m, SN/ISB, 200 kN	St	17,75
Invert	Excavation section	m ³	17,55
	Steel fabric mats Q 257, 2 Layer	m ²	25,70
	Shotcrete da=25 cm	m ²	12,44

The quantity data are for cross section CS1 with inner shell thickness of 60 cm. In case of inner shell thickness of 40 cm (cross section CS2), the values to adjust.

Legend :

- Kf ... Enlarged footing
- l ... Length
- a ... Distance in transverse direction
- e ... Distance in longitudinal direction
- A ... Connection of the reinforcement between the crown and bench
- SN ... Rock anchor
- SB ... Injection bore anchors
- ... Length of anchor 4 m
- ... Length of anchor 6 m
- × ... Tunnel face anchors with a length 12 m
- Typ 1 ... Girder GI 100
- Typ 2 ... Girder GI 120
- FS ... Girder at the foot of the crown



MINISTERUL TRANSPORTURILOR

BENEFICIAR / BENEFICIARY :



COMPANIA NAȚIONALĂ DE CĂI FERATE "CFR" SA



PROIECTANT / DESIGNER:

Sef de echipa Team leader

Expert Cheie Key Expert

Aprobat Approved

Proiectat Designed

Inginer Engineer

Data Date

Semnatura Signature

06/2013

C. Teodorescu

06/2013

M. Diegmann

06/2013

J. Werfling

06/2013

D. Ciotarnel

Project 9i
35311.1

"Reabilitarea liniei c.f. Frontieră - Curtici - Simeria, parte componentă a coridorului IV Pan - European pentru circulația trenurilor cu viteză maximă de 160 km/h"

Tronsonul 2: km 614-Gurasada
"Rehabilitation of the Railway Line Border - Curtici - Simeria, component Part of the IV Pan - European Corridor for the Trains Circulation with maximum speed of 160 km/h"

Section 2 : km 614-Gurasada

Denumire desen / Drawing name:
EXCAVATION CLASS 4.3

Scara / Scale
1:250

Cod desen / Drawing Code
EC 3

Nr / No
EC 3