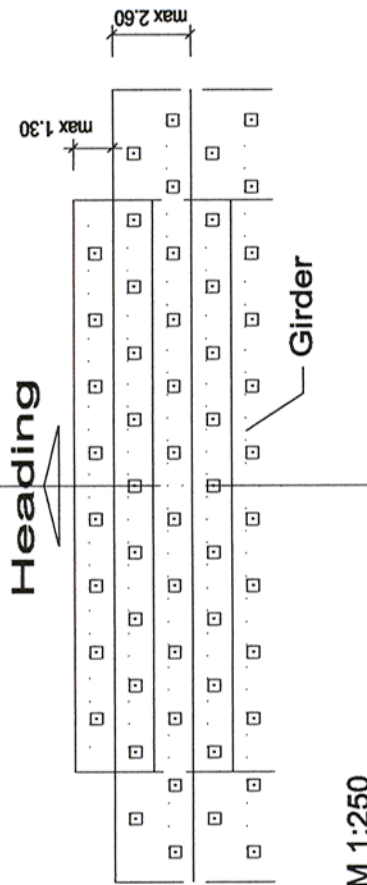
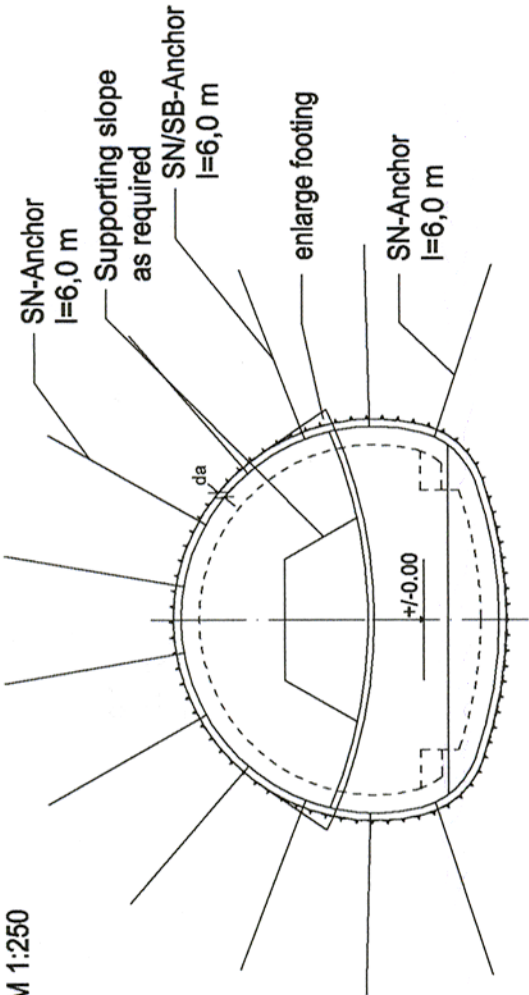
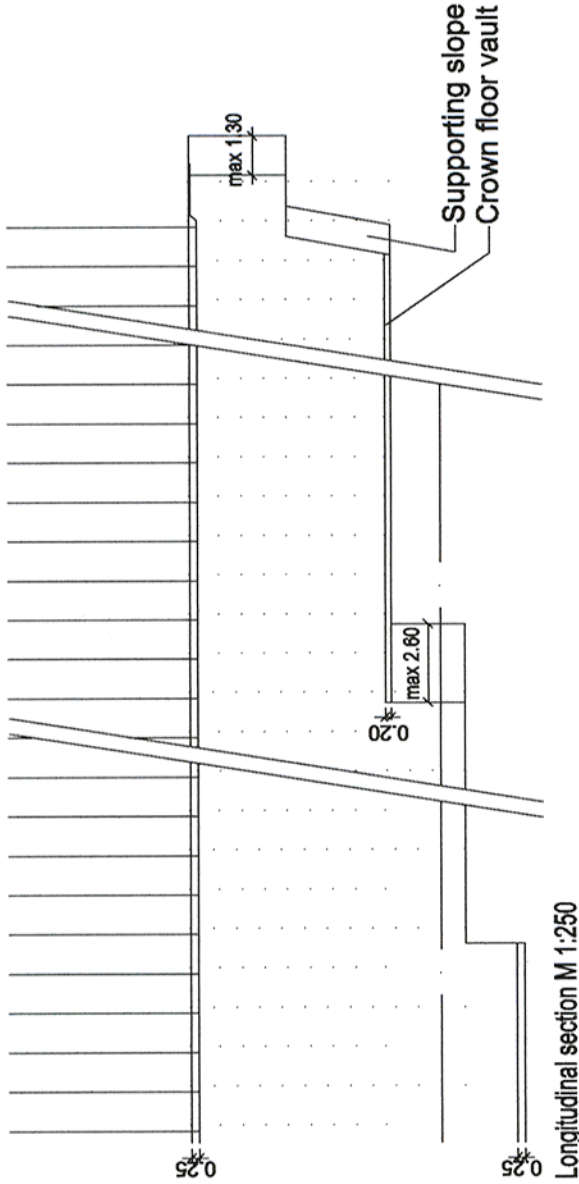




Execution M 1:250



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
- Arch of shotcrete in invert of crown after each excavation section

2. Bench:

- Trailing max. 60 m behind Crown

Excavation:

- Length of round max. 1,3 m

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
- Trailing distance up to 100 m from the face of the bench or according to measurement results

Excavation:

- Unsupported round length max. 10 m

Reinforcement:

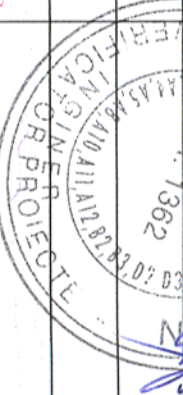
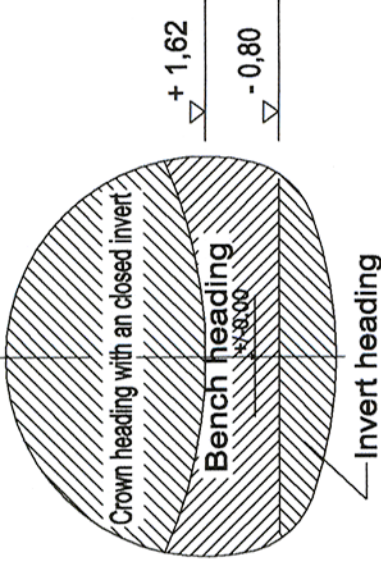
- Steel fabric mats, shotcrete after each round

ORT	Term	UNIT	QUANTITY PER LFM TUNNEL
Crown	Excavation section	m ³	63,30
	Steel fabric mats Q 257, 2 Layers, A	m ²	35,64
	Steel sets, girder Typ 1, e=1,3 m	m	13,71
	Shotcrete da=25 cm	m ²	17,82
	Anchor l=6,0 m, SN/SB, 200 kN	St	6,54
	Sealing shotcrete face 6 cm	m ²	30,00
Kf	Spiles with injection drill bolt l=3,5 m	St	as required
	Excavation section	m ³	0,50
	Shotcrete da=15 cm	m ³	0,50
	Steel (fabric mats, horizontal bars)	kg	35,00
Crown SG	Shotcrete da=20 cm	m ²	13,40
	Steel fabric mats Q 188, 2 Layer	m ²	26,80
Bench	Excavation section	m ³	37,58
	Steel fabric mats Q 257, 2 Layer	m ²	15,44
	Steel sets, girder Type 1, e=2,6 m	m	2,97
	Shotcrete da=25 cm	m ²	7,72
Invert	Anchor l=6,0 m, SN/SB, 200 kN	St	2,31
	Excavation section	m ³	17,75
	Steel fabric mats Q 257, 2 Layer	m ²	25,70
	Shotcrete da=25 cm	m ²	12,85

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
- x ... 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:

Aprobat
Approved

Sef de echipa
Team leader

Verificat
Checked

Expert Cheie
Key Expert

Aprobat
Approved

Adjunct Sef de echipa
Deputy Team leader

Proiectat
Designed

Inginer
Engineer

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

"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"

Denumire desen / Drawing name:
EXCAVATION CLASS 4.3

Scara / Scale

1:250

Cod desen / Drawing Code

EC 4

Nr / No

EC 4