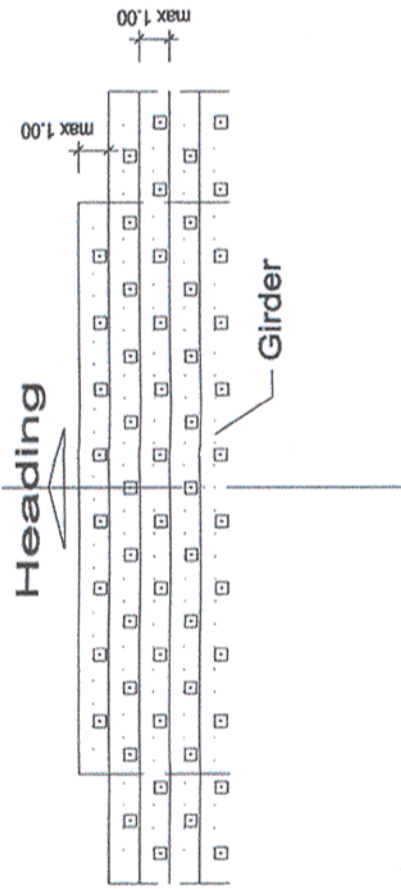
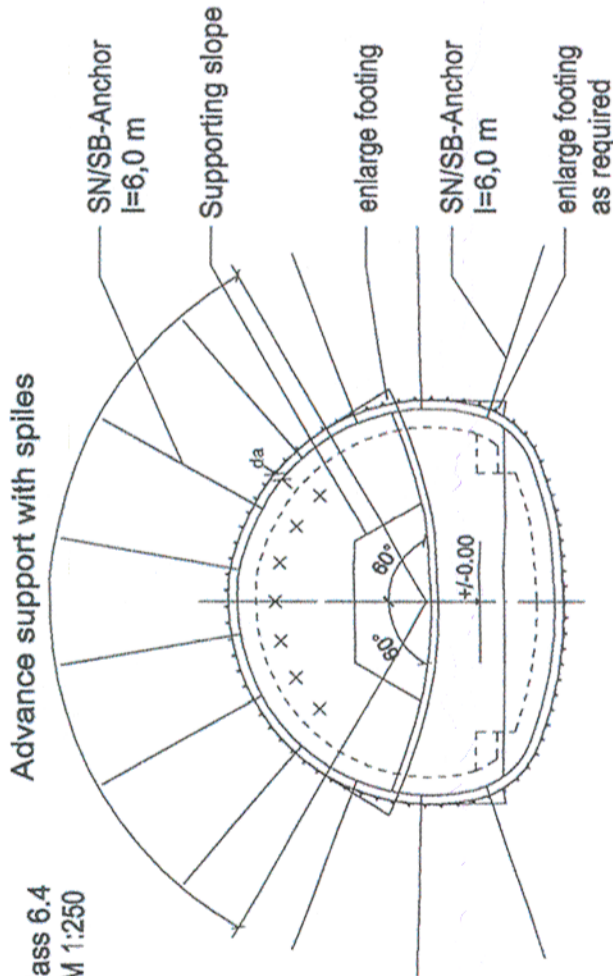
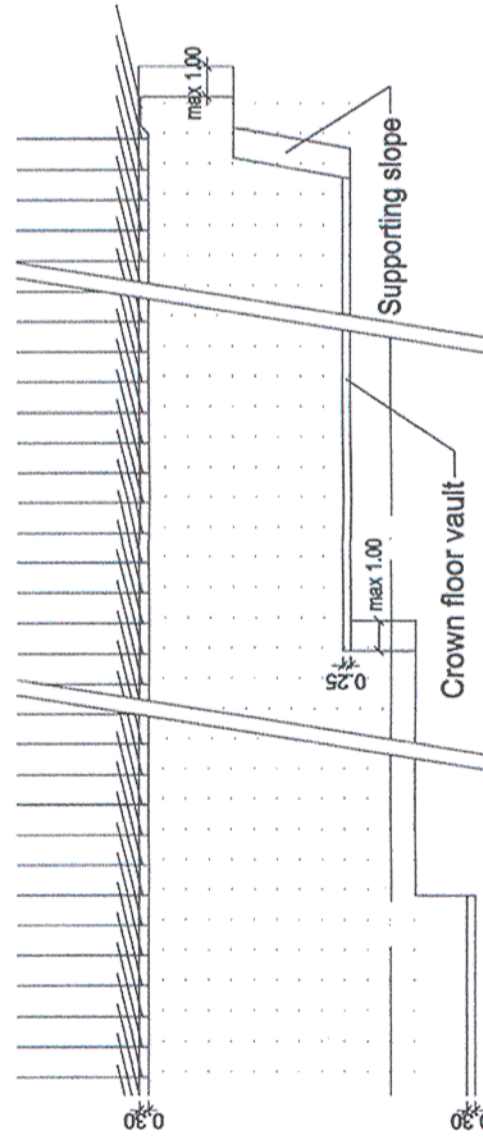


Excavation Class 6.4
Cross Section M 1:250



Execution M 1:250



Longitudinal section M 1:250

1. Crown

- Protruding fuse with spears before each round
- Length of round max. 1,0 m
- with supporting slope and enlarged footing - invert arch

Excavation:

- temporary crown face with shotcrete after each round
- Tunnel face anchors of 8 m
- 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

Reinforcement:

- Trailing max. 20 m behind Crown
- Length of round max. 1,0 m
- in full width with excavation section of shotcrete arch in invert of crown

Excavation:

- Steel fabric mats, shotcrete after each round
- Systematic anchoring at second round behind heading after each round

Reinforcement:

- Trailing distance up to 8 m from the face of the bench
- Unsupported round length max. 2 m

Excavation:

- Steel fabric mats, shotcrete after each round
- Systematic anchoring at second round behind heading after each round

Reinforcement:

- Trailing distance up to 8 m from the face of the bench
- Unsupported round length max. 2 m

Excavation:

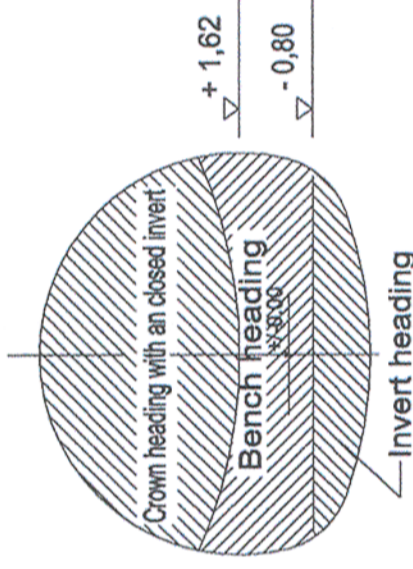
- Steel fabric mats, shotcrete after each round

ORT	Term	UNIT	QUANTITY PER LFM TUNNEL
Crown	Excavation section	m ³	64,22
	Steel fabric mats Q 335, 2 Layers, A	m ²	35,47
	Steel sets, girder Typ 1, e=1,0 m, FS	m	17,88
	Shotcrete da=30 cm	m ²	17,88
	Anchor l=6,0 m, SN/SB, 200 kN	St	8,50
	Reinforced shotcrete face 10 cm	m ²	38,50
	Tunnel face anchor l=12 m, e=8,0 m	St	0,875
	Spiles with injection drill l=3,5 m, a=0,3 m, e=1,0 m	St	47,00
	Shotcrete da=15 cm	m ²	13,40
	Steel fabric mats 2 x Q 257, 2 Layer	m ²	26,80
Crown	Excavation section	m ³	0,50
	Shotcrete da=15 cm	m ³	0,50
Kf	Steel (fabric mats, horizontal bars)	kg	35,00
	Excavation section	m ³	37,97
Bench	Steel fabric mats Q 257, 2 Layer	m ²	15,48
	Steel sets, girder Type 2, e=1,0 m	m	7,74
	Shotcrete da=30 cm	m ²	7,74
	Anchor l=6,0 m, SN/SB, 200 kN	St	3,00
Invert	Excavation section	m ³	18,42
	Steel fabric mats Q 257, 2 Layer	m ²	25,86
	Shotcrete da=30 cm	m ²	12,93

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	C. Teodorescu	Data Date	Semnatura Signature
Verificat Checked	Expert Cheie Key Expert	M. Diegmann	06/2013	
Aprobat Approved	Adjunct Sef de echipa Deputy Team leader	J. Werfling	06/2013	
Proiectat Designed	Inginer Engineer	D. Ciotanel	06/2013	

"Reabilitarea liniei c.f. Frontiera - 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 6.2

Scara / Scale

1:250

Cod desen / Drawing Code

EC 8

Nr / No

EC 8