

Support Category SC D

Ground Type 3

Input

Weight	γ	N/mm ³	0,028
Poisson ratio	ν	-	0,15
Dilation factor	α	-	1,12
Radius Tunnel	R_o	m	6,00
Overburden *)	H	m	975,0
Confining pressure	K_o	-	1,00
Friction angle elastic	φ_{el}	°	40,0
Friction angle plastic	φ_{pl}	°	36,0
Cohesion elastic	C_{el}	MPa	10,00
Cohesion plastic	C_{pl}	MPa	7,0
E-Modulus rock mass	E	MPa	70000
Support pressure	P_i	MPa	0,540
angle of scan line		°	90

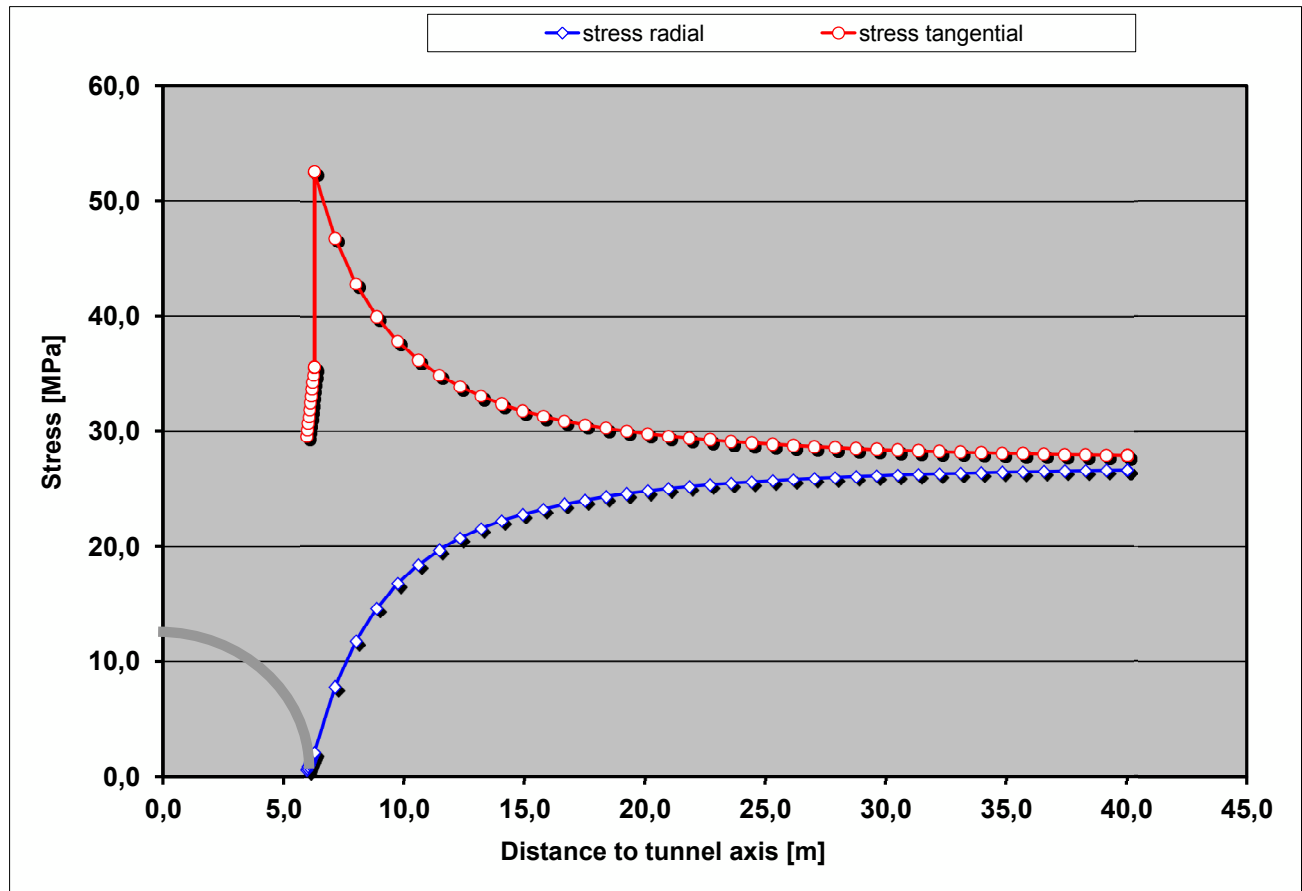
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R^*	m	6,31
Depth of failure zone	d_f	m	0,31
Displacement roof	u_c	cm	0,28
Displacement side wall	u_w	cm	0,28

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC D

Ground Type 4

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R_0	m	6,00
Overburden *)	H	m	600,0
Confining pressure	K_0	-	1,00
Friction angle elastic	φ_{el}	°	27,0
Friction angle plastic	φ_{pl}	°	24,3
Cohesion elastic	C_{el}	MPa	2,50
Cohesion plastic	C_{pl}	MPa	1,8
E-Modulus rock mass	E	MPa	6000
Support pressure	P_i	MPa	0,536
angle of scan line		°	90

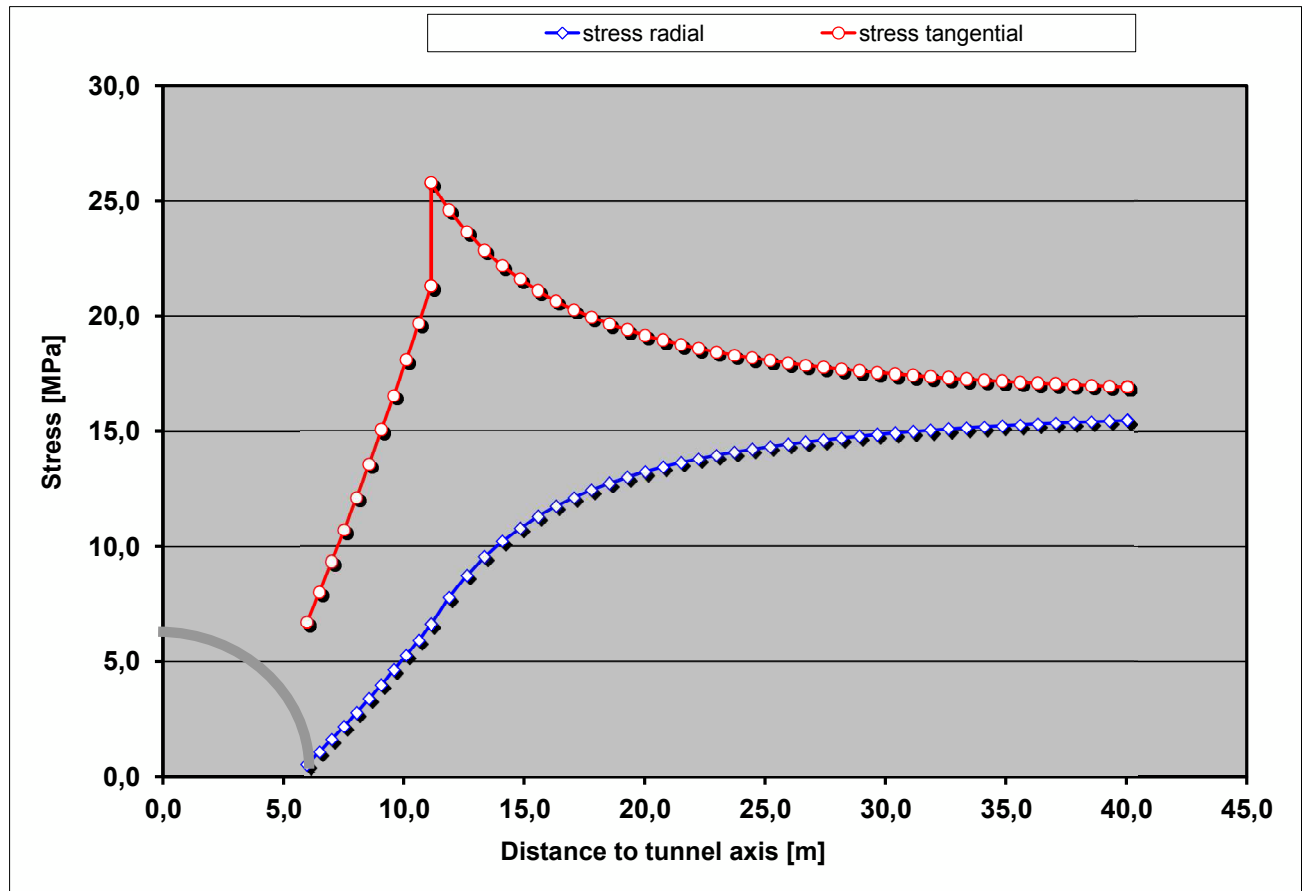
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R^-	m	11,15
Depth of failure zone	d_f	m	5,15
Displacement roof	u_c	cm	5,05
Displacement side wall	u_w	cm	5,05

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC E

Ground Type 4

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden *)	H	m	975,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	27,0
Friction angle plastic	φ_{pl}	°	24,3
Cohesion elastic	C _{el}	MPa	2,50
Cohesion plastic	C _{pl}	MPa	1,8
E-Modulus rock mass	E	MPa	6000
Support pressure	P _i	MPa	0,640
angle of scan line		°	90

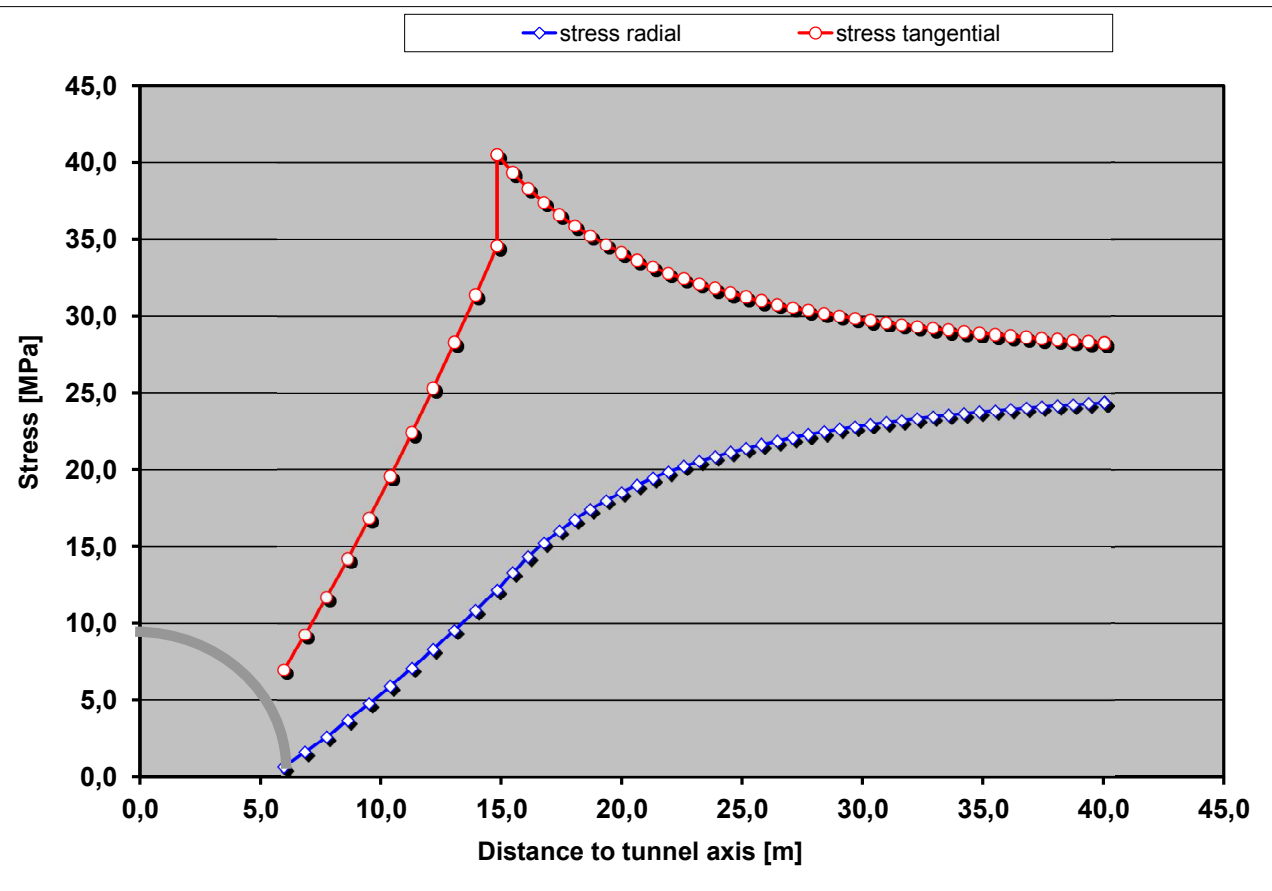
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R ⁻	m	14,84
Depth of failure zone	d _f	m	8,84
Displacement roof	u _c	cm	14,76
Displacement side wall	u _w	cm	14,76

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC D

Ground Type 5

Input

Weight	γ	N/mm ³	0,029
Poisson ratio	ν	-	0,15
Dilation factor	α	-	1,12
Radius Tunnel	R_0	m	6,00
Overburden *)	H	m	975,0
Confining pressure	K_0	-	1,00
Friction angle elastic	φ_{el}	°	33,0
Friction angle plastic	φ_{pl}	°	29,7
Cohesion elastic	C_{el}	MPa	4,00
Cohesion plastic	C_{pl}	MPa	2,8
E-Modulus rock mass	E	MPa	35000
Support pressure	P_i	MPa	0,563
angle of scan line		°	90

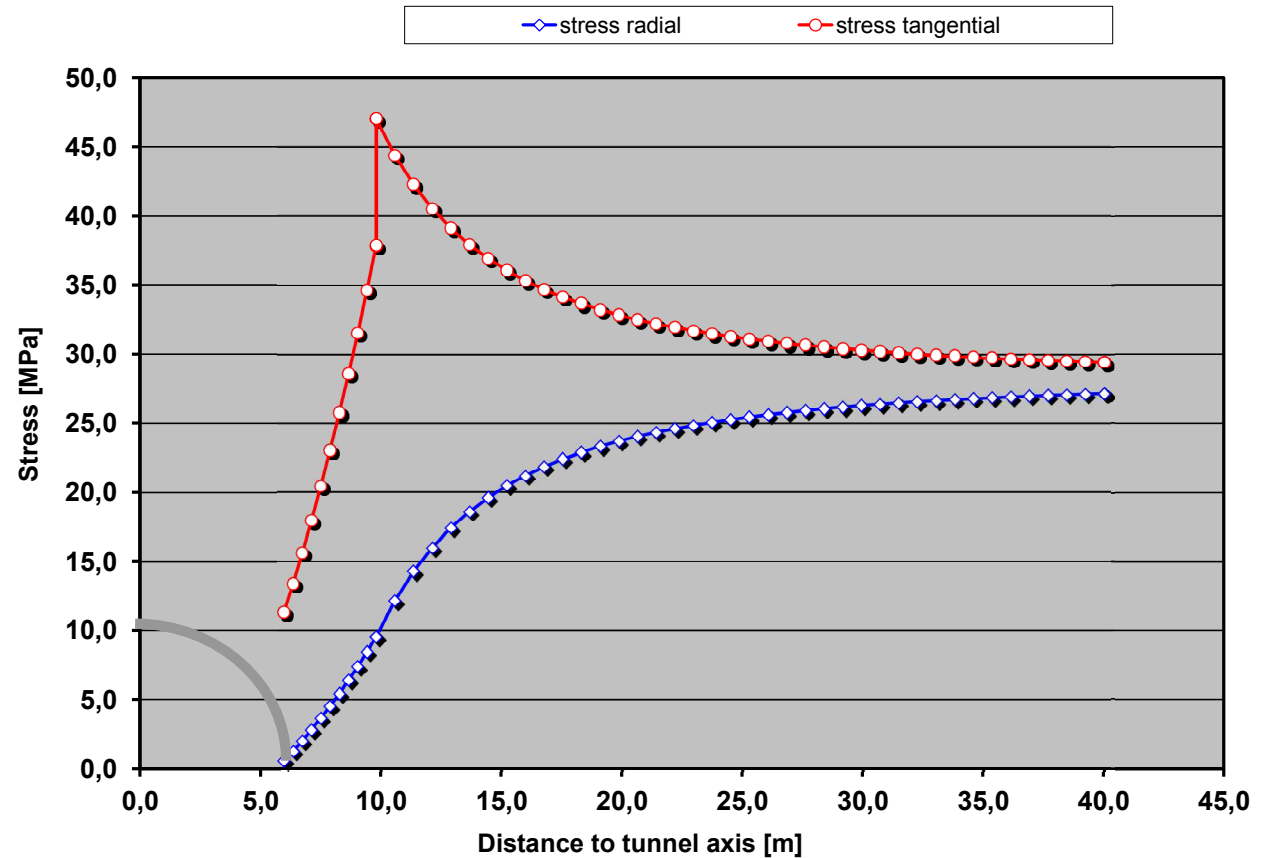
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R^-	m	9,83
Depth of failure zone	d_f	m	3,83
Displacement roof	u_c	cm	1,27
Displacement side wall	u_w	cm	1,27

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC D

Ground Type 6

Input

Weight	γ	N/mm ³	0,028
Poisson ratio	ν	-	0,15
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden *)	H	m	300,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	27,0
Friction angle plastic	φ_{pl}	°	24,3
Cohesion elastic	C _{el}	MPa	2,00
Cohesion plastic	C _{pl}	MPa	1,4
E-Modulus rock mass	E	MPa	6000
Support pressure	P _i	MPa	0,536
angle of scan line		°	90

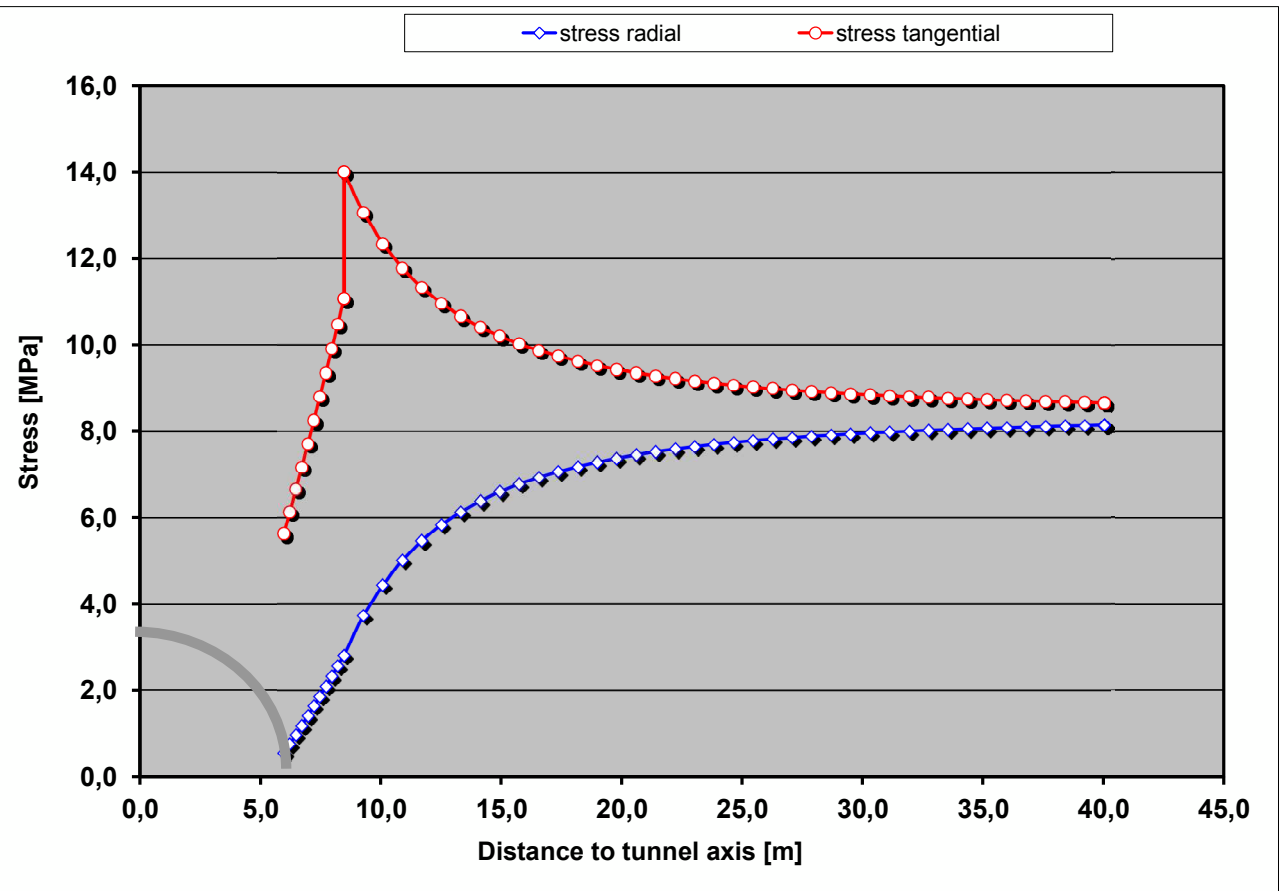
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R ⁻	m	8,49
Depth of failure zone	d _f	m	2,49
Displacement roof	u _c	cm	1,48
Displacement side wall	u _w	cm	1,48

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC F

Ground Type 6

Input

Weight	γ	N/mm ³	0,028
Poisson ratio	ν	-	0,15
Dilation factor	α	-	1,12
Radius Tunnel	R_0	m	6,00
Overburden *)	H	m	975,0
Confining pressure	K_0	-	1,00
Friction angle elastic	φ_{el}	°	27,0
Friction angle plastic	φ_{pl}	°	24,3
Cohesion elastic	C_{el}	MPa	2,00
Cohesion plastic	C_{pl}	MPa	1,4
E-Modulus rock mass	E	MPa	6000
Support pressure	P_i	MPa	0,800
angle of scan line		°	90

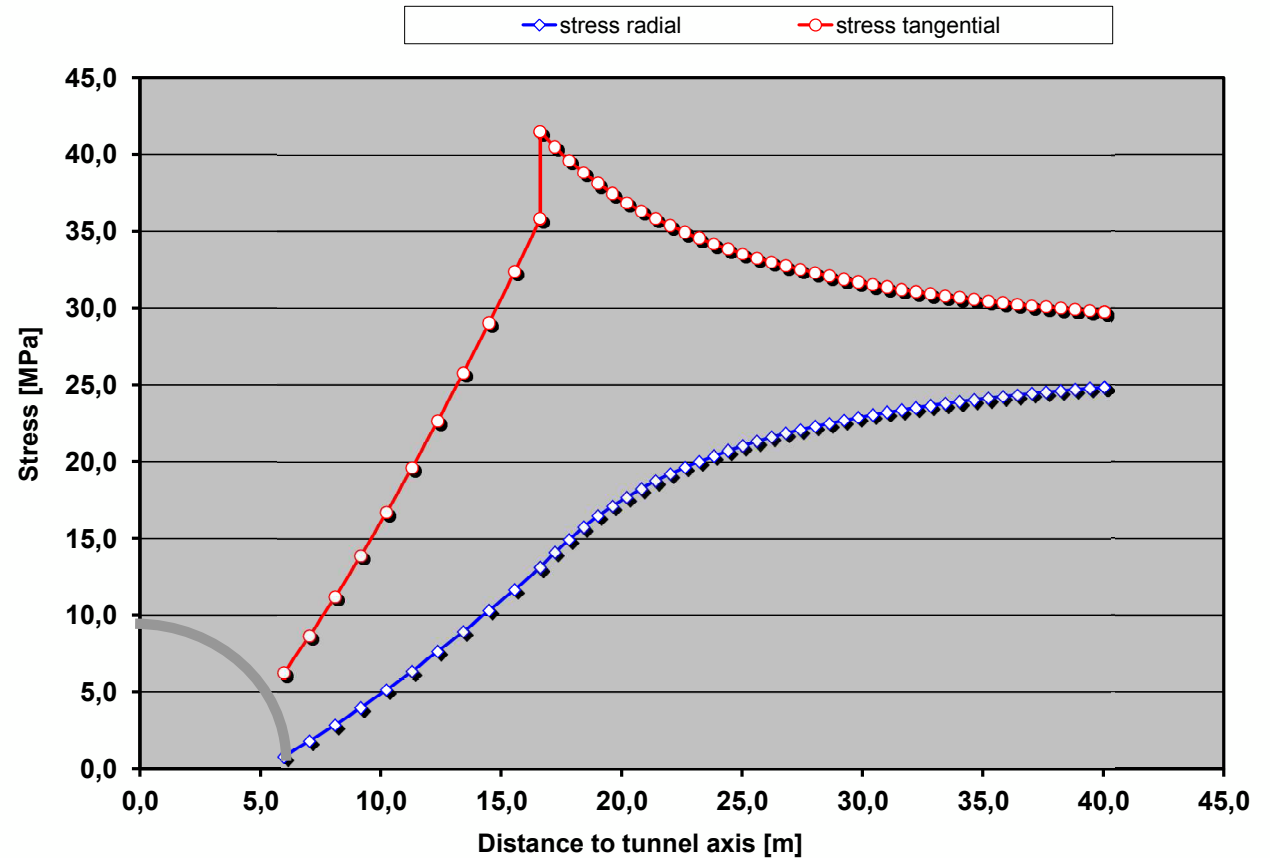
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R^*	m	16,63
Depth of failure zone	d_f	m	10,63
Displacement roof	u_c	cm	19,43
Displacement side wall	u_w	cm	19,43

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC D

Ground Type 7

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden *)	H	m	120,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	23,0
Friction angle plastic	φ_{pl}	°	20,7
Cohesion elastic	C _{el}	MPa	1,00
Cohesion plastic	C _{pl}	MPa	0,7
E-Modulus rock mass	E	MPa	1500
Support pressure	P _i	MPa	0,390
angle of scan line		°	90

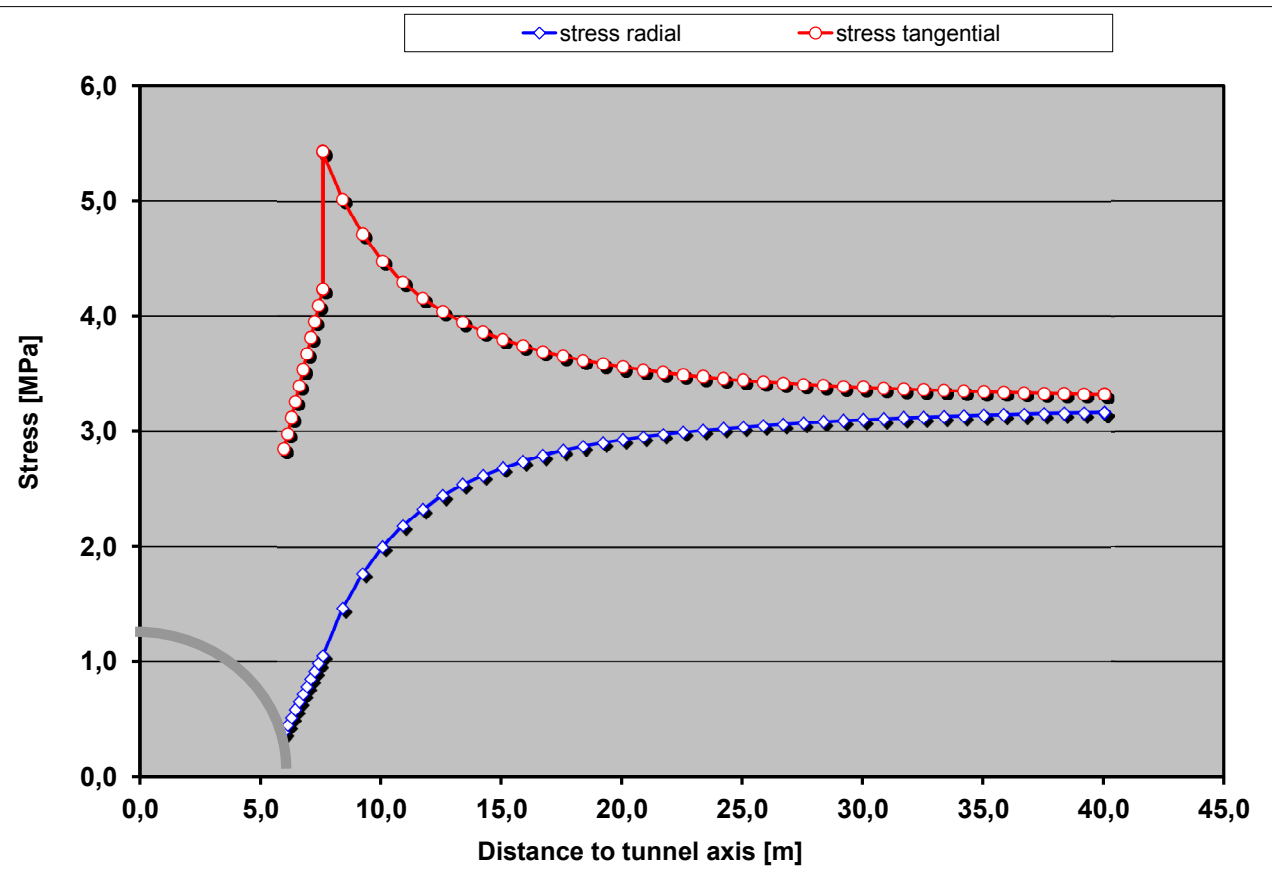
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R ⁻	m	7,60
Depth of failure zone	d _f	m	1,60
Displacement roof	u _c	cm	1,83
Displacement side wall	u _w	cm	1,83

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC E

Ground Type 7

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden *)	H	m	225,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	23,0
Friction angle plastic	φ_{pl}	°	20,7
Cohesion elastic	C _{el}	MPa	1,00
Cohesion plastic	C _{pl}	MPa	0,7
E-Modulus rock mass	E	MPa	1500
Support pressure	P _i	MPa	0,640
angle of scan line		°	90

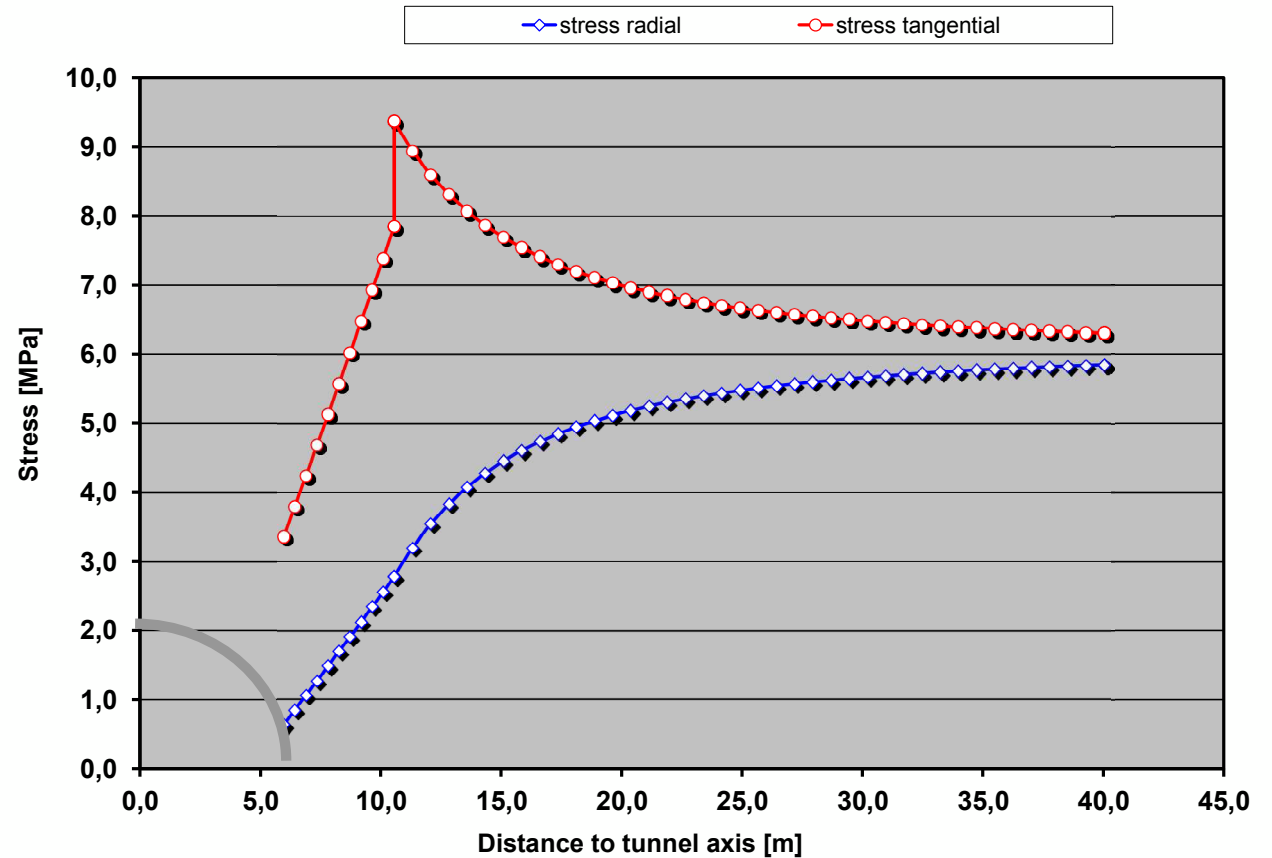
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R _p	m	10,58
Depth of failure zone	d _f	m	4,58
Displacement roof	u _c	cm	6,00
Displacement side wall	u _w	cm	6,00

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC F

Ground Type 7

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R_0	m	6,00
Overburden *)	H	m	300,0
Confining pressure	K_0	-	1,00
Friction angle elastic	φ_{el}	°	23,0
Friction angle plastic	φ_{pl}	°	20,7
Cohesion elastic	C_{el}	MPa	1,00
Cohesion plastic	C_{pl}	MPa	0,7
E-Modulus rock mass	E	MPa	1500
Support pressure	P_i	MPa	0,800
angle of scan line		°	90

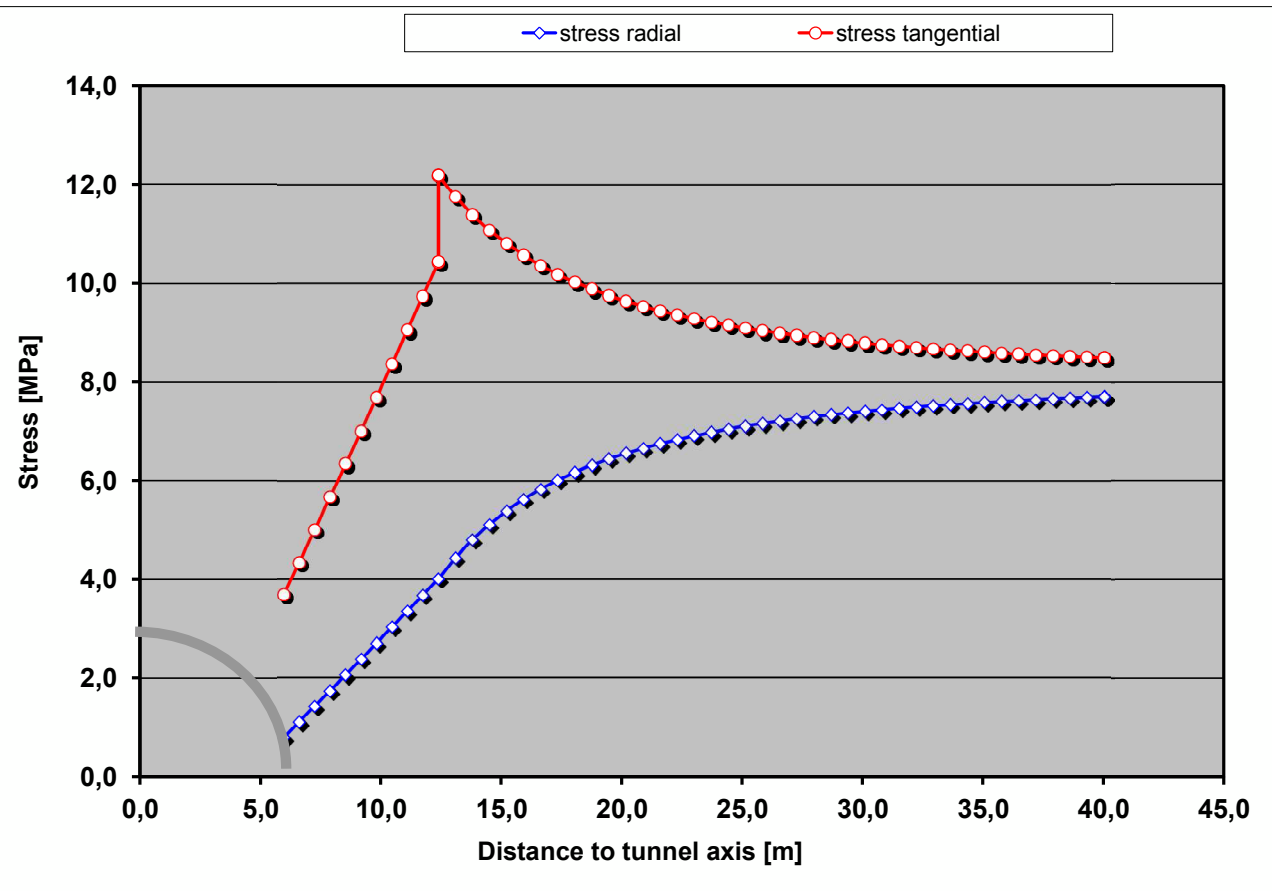
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R^-	m	12,40
Depth of failure zone	d_f	m	6,40
Displacement roof	u_c	cm	10,88
Displacement side wall	u_w	cm	10,88

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC G

Ground Type 7

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden	H	m	600,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	23,0
Friction angle plastic	φ_{pl}	°	20,7
Cohesion elastic	C _{el}	MPa	1,00
Cohesion plastic	C _{pl}	MPa	0,7
E-Modulus rock mass	E	MPa	1500
Support pressure	P _i	MPa	0,800
angle of scan line		°	90

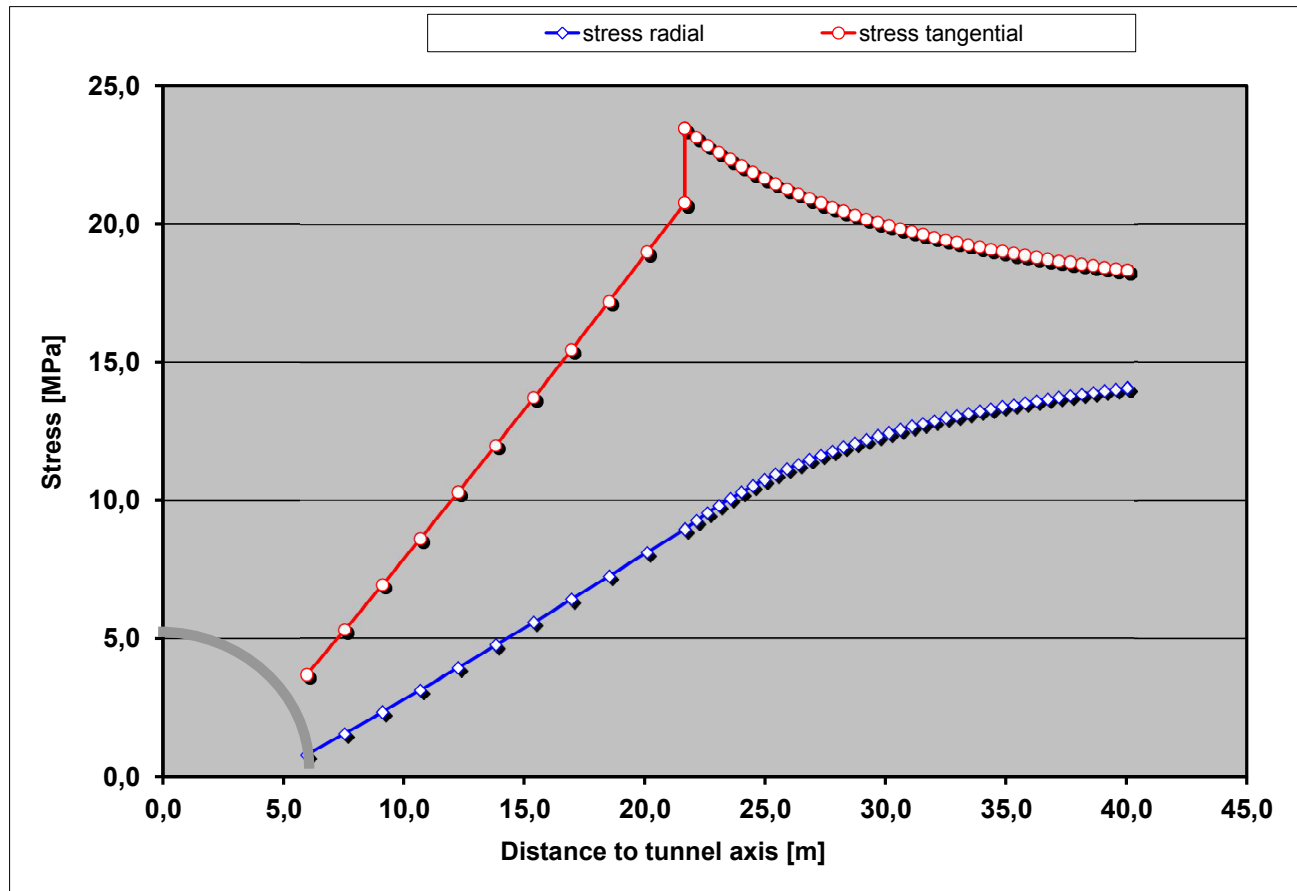
*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R ⁻	m	21,67
Depth of failure zone	d _f	m	15,67
Displacement roof	u _c	cm	70,05
Displacement side wall	u _w	cm	70,05

Scaling

max. Distance		m	40,0
max. Points elastic		-	40



Support Category SC G

Ground Type 7

Input

Weight	γ	N/mm ³	0,027
Poisson ratio	ν	-	0,20
Dilation factor	α	-	1,12
Radius Tunnel	R ₀	m	6,00
Overburden *)	H	m	750,0
Confining pressure	K ₀	-	1,00
Friction angle elastic	φ_{el}	°	23,0
Friction angle plastic	φ_{pl}	°	20,7
Cohesion elastic	C _{el}	MPa	1,00
Cohesion plastic	C _{pl}	MPa	0,7
E-Modulus rock mass	E	MPa	1500
Support pressure	P _i	MPa	0,800
angle of scan line		°	90

*) 1.5 times of overburden with respect to the shape of the valley above the tunnel according to numerical analysis

Result

Plastic radius	R ⁻	m	26,16
Depth of failure zone	d _f	m	20,16
Displacement roof	u _c	cm	129,60
Displacement side wall	u _w	cm	129,60

Scaling

max. Distance		m	80,0
max. Points elastic		-	40

