

3.4 STATIČNI IZRAČUN CEVI

3.4.1 FEKALNA KANALIZACIJA

3.4.1.1 PP cev DN 250 SN 12, minimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP

Outside diameter

250 [mm]

Wall thickness

9.4 [mm]

☐ Pragma pipe

Configuration

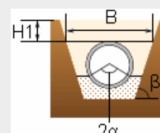
B 1.5 [m]

H1 0.62 [m]

β 90 [°]

Bedding angle 2α 120°

Soil density ρ 25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type Compacted backfill in all the height of the trench

Backfill soil type Group 3 - mixed cohesive

Backfill compaction 95%

Sidewalls soil type Group 1 - non cohesive

Sidewalls compaction 92%

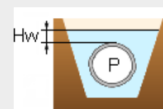
Advice

Ground water/internal pressure

☒ Ignore ground water/internal pressure

Ground water height 1.29 [m]

Internal pressure 0 [bar]



Traffic

☒ Ignore traffic

Truck HT 26 - 26 tons, 2 axles

Frequency Normal

Paving

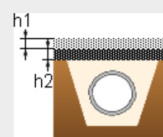
☒ Ignore paving

h1 0.1 [m]

Ep1 12000 [MPa]

h2 0.35 [m]

Ep2 150 [MPa]



Advice

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	11.0	9.23	[kN/m ²]
Concentrated surcharges	Pvc	0.000	0.000	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	0.782	0.938	[mm]
Deformation	δ_v	0.325	0.390	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	0.719	0.381	[MPa]
Side	σ	0.487	0.199	[MPa]
Base	σ	0.975	0.612	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	48.7	52.6	
Side	η_1	71.9	100	
Base	η_1	35.9	32.7	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.4.1.2 PP cev DN 250 SN 12, maksimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

250 [mm]

Wall thickness

9.4 [mm]

☐ Pragma pipe

Configuration

B

1.5 [m]

H1

2.64 [m]

 β

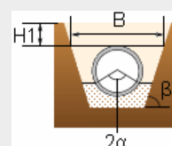
90 [°]

Bedding angle 2α

120° ▼

Soil density ρ

25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type

Compacted backfill in all the height of the trench ▼

Backfill soil type

Group 3 - mixed cohesive ▼

Backfill compaction

95% ▼

Sidewalls soil type

Group 1 - non cohesive ▼

Sidewalls compaction

92% ▼

[Advice](#)

Ground water/internal pressure

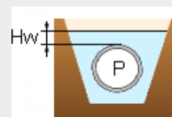
☐ Ignore ground water/internal pressure

Ground water height

1.29 [m]

Internal pressure

0 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

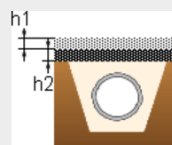
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]


[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	q_v	32.3	26.3	[kN/m ²]
Concentrated surcharges	P_{vc}	4.55	4.55	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	2.65	3.17	[mm]
Deformation	δ_v	1.10	1.32	[%]
	δ_v	<5% OK	<5% OK	
Maximum tangential stress		Short term	Long term	
Top	σ	2.58	1.60	[MPa]
Side	σ	1.80	1.01	[MPa]
Base	σ	3.18	2.12	[MPa]
Material strength	σ	35.0 OK	20.0 OK	[MPa]
Crack safety coefficient		Short term	Long term	
Top	η_1	13.6	12.5	
Side	η_1	19.4	19.8	
Base	η_1	11.0	9.42	
Material safety coefficient	η_1	2.00 OK	2.00 OK	

3.4.2 METERONA KANALIZACIJA

3.4.2.1 PP cev DN 250 SN 12,

3.4.2.1.1 PP cev DN 250 SN 12, minimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

250 [mm]

Wall thickness

9.4 [mm]

☐ Pragma pipe

Configuration

B

1.5 [m]

H1

0.62 [m]

β

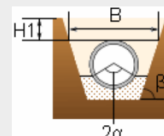
90 [°]

Bedding angle 2α

120° ▼

Soil density ρ

25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type

Compacted backfill in all the height of the trench ▼

Backfill soil type

Group 3 - mixed cohesive ▼

Backfill compaction

95% ▼

Sidewalls soil type

Group 1 - non cohesive ▼

Sidewalls compaction

92% ▼

[Advice](#)

Ground water/internal pressure

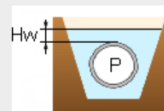
☒ Ignore ground water/internal pressure

Ground water height

0.17 [m]

Internal pressure

0 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

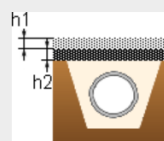
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	11.0	9.23	[kN/m ²]
Concentrated surcharges	Pvc	8.66	8.66	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	1.63	2.27	[mm]
Deformation	δ_v	0.678	0.944	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	3.00	2.66	[MPa]
Side	σ	2.57	2.28	[MPa]
Base	σ	3.37	3.01	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	11.7	7.52	
Side	η_1	13.6	8.76	
Base	η_1	10.4	6.65	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.4.2.2 PVC cev DN 250 SN 12, maksimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

250 [mm]

Wall thickness

9.4 [mm]

☐ Pragma pipe

Configuration

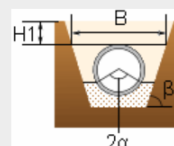
B 1.5 [m]

H1 0.97 [m]

β 90 [°]

Bedding angle 2α 120° ▼

Soil density ρ 25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type Compacted backfill in all the height of the trench ▼

Backfill soil type Group 3 - mixed cohesive ▼

Backfill compaction 95% ▼

Sidewalls soil type Group 1 - non cohesive ▼

Sidewalls compaction 92% ▼

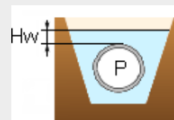
[Advice](#)

Ground water/internal pressure

☒ Ignore ground water/internal pressure

Ground water height 0.17 [m]

Internal pressure 0 [bar]



Traffic

☐ Ignore traffic

Truck HT 26 - 26 tons, 2 axles ▼

Frequency Normal ▼

Paving

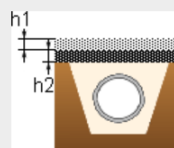
☐ Ignore paving

h1 0.1 [m]

Ep1 12000 [MPa]

h2 0.35 [m]

Ep2 150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	15.8	13.1	[kN/m ²]
Concentrated surcharges	Pvc	7.56	7.56	[kN/m ²]

Deformation		Short term	Long term	
Displacement	ΔD_v	1.85	2.45	[mm]
Deformation	δ_v	0.767	1.02	[%]
	δ_v	<5%	<5%	
		OK	OK	

Maximum tangential stress		Short term	Long term	
Top	σ	2.90	2.42	[MPa]
Side	σ	2.40	1.99	[MPa]
Base	σ	3.32	2.80	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	

Crack safety coefficient		Short term	Long term	
Top	η_1	12.1	8.27	
Side	η_1	14.6	10.0	
Base	η_1	10.5	7.13	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.4.2.3 PVC cev DN 200 SN 10,

3.4.2.3.1 PVC cev DN 200 SN 10, minimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

200 [mm]

Wall thickness

7.5 [mm]

☐ Pragma pipe

Configuration

B

1.4 [m]

H1

1.27 [m]

β

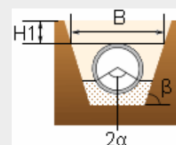
90 [°]

Bedding angle 2α

120° ▼

Soil density ρ

25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type

Compacted backfill in all the height of the trench ▼

Backfill soil type

Group 3 - mixed cohesive ▼

Backfill compaction

95% ▼

Sidewalls soil type

Group 1 - non cohesive ▼

Sidewalls compaction

92% ▼

[Advice](#)

Ground water/internal pressure

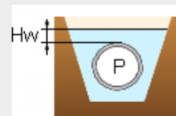
☐ Ignore ground water/internal pressure

Ground water height

0.17 [m]

Internal pressure

0 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

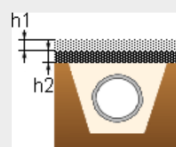
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv		18.8	15.4 [kN/m²]
Concentrated surcharges	Pvc		6.82	6.82 [kN/m²]
Deformation		Short term	Long term	
Displacement	ΔD_v		1.60	2.06 [mm]
Deformation	δ_v		0.831	1.07 [%]
	δ_v		<5%	<5%
			OK	OK
Maximum tangential stress		Short term	Long term	
Top	σ		2.77	2.19 [MPa]
Side	σ		2.21	1.74 [MPa]
Base	σ		3.20	2.57 [MPa]
Material strength	σ		35.0	20.0 [MPa]
			OK	OK
Crack safety coefficient		Short term	Long term	
Top	η_1		12.7	9.15
Side	η_1		15.8	11.5
Base	η_1		10.9	7.77
Material safety coefficient	η_1		2.00	2.00
			OK	OK

3.4.2.3.2 PVC cev DN 200 SN 10, maksimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

200 [mm]

Wall thickness

7.5 [mm]

☐ Pragma pipe

Configuration

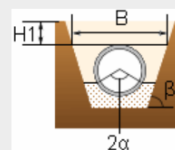
B 1.4 [m]

H1 1.91 [m]

β 90 [°]

Bedding angle 2α 120° ▼

Soil density ρ 25 [kN/m³]



Soil configuration (backfill and sidewalls)

Backfill installation type Compacted backfill in all the height of the trench ▼

Backfill soil type Group 3 - mixed cohesive ▼

Backfill compaction 95% ▼

Sidewalls soil type Group 1 - non cohesive ▼

Sidewalls compaction 92% ▼

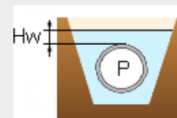
[Advice](#)

Ground water/internal pressure

☐ Ignore ground water/internal pressure

Ground water height 0.61 [m]

Internal pressure 0 [bar]



Traffic

☐ Ignore traffic

Truck HT 26 - 26 tons, 2 axles ▼

Frequency Normal ▼

Paving

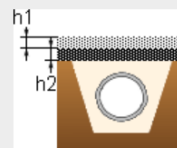
☒ Ignore paving

h1 0.1 [m]

Ep1 12000 [MPa]

h2 0.35 [m]

Ep2 150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	25.2	20.5	[kN/m²]
Concentrated surcharges	Pvc	13.9	13.9	[kN/m²]
Deformation		Short term	Long term	
Displacement	ΔD_v	2.51	3.32	[mm]
Deformation	δ_v	1.31	1.73	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	4.84	4.07	[MPa]
Side	σ	4.00	3.37	[MPa]
Base	σ	5.46	4.62	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	7.23	4.91	
Side	η_1	8.75	5.94	
Base	η_1	6.41	4.33	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

Računala:
Ana Cvikl