

3.3 STATIČNI IZRAČUN CEVI

3.3.1 PP cev DN 315 SN 12

3.3.1.1 PP cev DN 315 SN 12, minimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

315 [mm]

Wall thickness

11.9 [mm]

☐ Pragma pipe

Configuration

B

1.6 [m]

H1

1.0 [m]

β

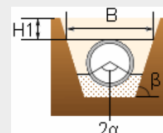
90 [°]

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

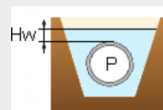
☒ Ignore ground water/internal pressure

Ground water height

1 [m]

Internal pressure

2 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

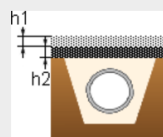
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	16.8	14.0	[kN/m ²]
Concentrated surcharges	Pvc	7.48	7.48	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	2.35	3.14	[mm]
Deformation	δ_v	0.777	1.04	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	2.96	2.45	[MPa]
Side	σ	2.43	2.01	[MPa]
Base	σ	3.42	2.87	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	11.8	8.15	
Side	η_1	14.4	9.95	
Base	η_1	10.2	6.96	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.3.1.2 PP cev DN 315 SN 12, maksimalno kritje

Pipe

☒ Standard smooth pipe

Material

PP ▼

Outside diameter

315 [mm]

Wall thickness

11.9 [mm]

☐ Pragma pipe

Configuration

B

1.6 [m]

H1

1.7 [m]

β

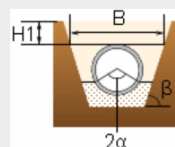
90 [°]

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

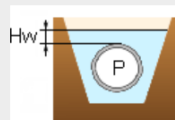
☒ Ignore ground water/internal pressure

Ground water height

1 [m]

Internal pressure

2 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

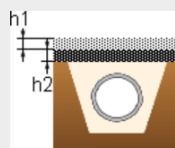
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	25.1	20.6	[kN/m ²]
Concentrated surcharges	Pvc	5.94	5.94	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	2.85	3.59	[mm]
Deformation	δ_v	0.941	1.18	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	2.88	2.13	[MPa]
Side	σ	2.21	1.60	[MPa]
Base	σ	3.43	2.62	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	12.2	9.39	
Side	η_1	15.8	12.5	
Base	η_1	10.2	7.64	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.3.2 PP cev DN 250 SN 12

3.3.2.1 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

1.06 [m]

β

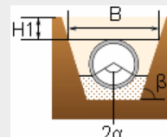
90 [°]

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

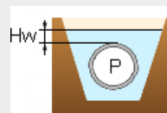
☒ Ignore ground water/internal pressure

Ground water height

1 [m]

Internal pressure

2 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

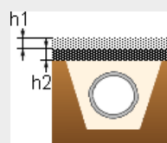
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
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Soil load	qv	16.9	14.0	[kN/m ²]
Concentrated surcharges	Pvc	7.32	7.32	[kN/m ²]

Deformation		Short term	Long term	
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Displacement	ΔD_v	1.90	2.50	[mm]
Deformation	δ_v	0.789	1.04	[%]
	δ_v	<5%	<5%	
		OK	OK	

Maximum tangential stress		Short term	Long term	
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Top	σ	2.89	2.37	[MPa]
Side	σ	2.36	1.93	[MPa]
Base	σ	3.32	2.76	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	

Crack safety coefficient		Short term	Long term	
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Top	η_1	12.1	8.45	
Side	η_1	14.8	10.4	
Base	η_1	10.5	7.24	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

3.3.2.2 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

1.99 [m]

β

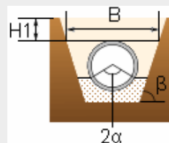
90 [°]

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

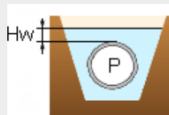
☒ Ignore ground water/internal pressure

Ground water height

1 [m]

Internal pressure

2 [bar]



Traffic

☐ Ignore traffic

Truck

HT 26 - 26 tons, 2 axles ▼

Frequency

Normal ▼

Paving

☐ Ignore paving

h1

0.1 [m]

Ep1

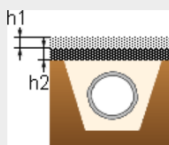
12000 [MPa]

h2

0.35 [m]

Ep2

150 [MPa]



[Advice](#)

Vertical pressure caused by soil load		Short term	Long term	
Soil load	qv	26.9	22.0	[kN/m ²]
Concentrated surcharges	Pvc	5.45	5.45	[kN/m ²]
Deformation		Short term	Long term	
Displacement	ΔD_v	2.38	2.93	[mm]
Deformation	δ_v	0.988	1.22	[%]
	δ_v	<5%	<5%	
		OK	OK	
Maximum tangential stress		Short term	Long term	
Top	σ	2.78	1.97	[MPa]
Side	σ	2.09	1.42	[MPa]
Base	σ	3.33	2.44	[MPa]
Material strength	σ	35.0	20.0	[MPa]
		OK	OK	
Crack safety coefficient		Short term	Long term	
Top	η_1	12.6	10.2	
Side	η_1	16.7	14.1	
Base	η_1	10.5	8.18	
Material safety coefficient	η_1	2.00	2.00	
		OK	OK	

Računala:
Ana Cviki