

Pipe Analysis Report



Project name: Pipe example 1
Project number: 2026-A01
Client: Randwater
Designer: Marco van Dijk
Date analysed: 2026-09-16 14:27:33

Included sections

1. Thrust Block Design

DISCLAIMER

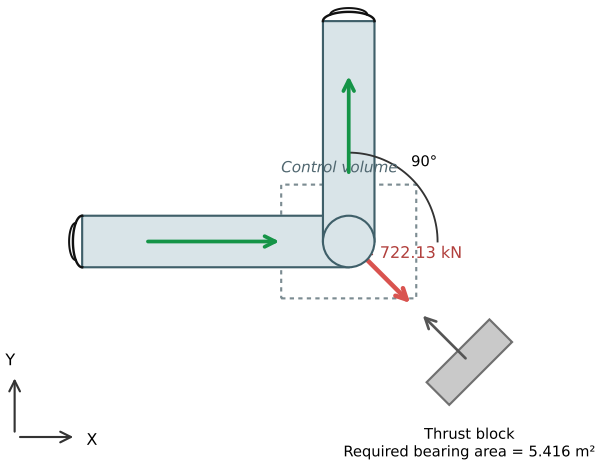
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Thrust Block Design

Bend - B-TB 1 - Chainage 245 m

Input data	
Internal pressure	18 bar
Flow rate, Q	690 l/s
Inlet diameter, D ₁	600 mm
Outlet diameter, D ₂	600 mm
Bend angle	90°
Safety factor	1.5
Soil bearing capacity	200 kPa

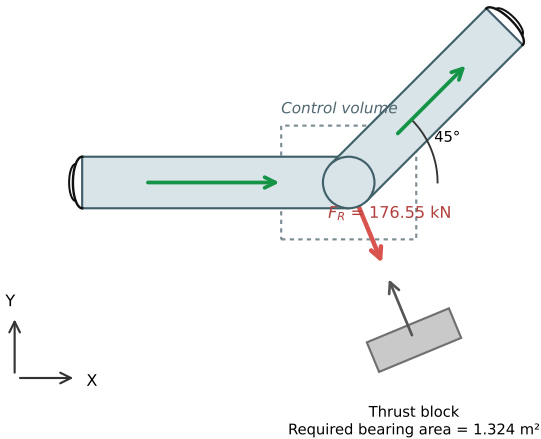
Results	
Resultant force, F _x	510.622 kN
Resultant force, F _y	-510.622 kN
Resultant in X-Y plane	722.128 kN
Direction in X-Y plane	315.0°
Required bearing area	5.416 m ²
Inlet velocity	2.440 m/s
Outlet velocity	2.440 m/s



Bend - B-TB2 - Chaninage 4250 m

Input data	
Internal pressure	18 bar
Flow rate, Q	750 l/s
Inlet diameter, D ₁	400 mm
Outlet diameter, D ₂	400 mm
Bend angle	45°
Safety factor	1.5
Soil bearing capacity	200 kPa

Results	
Resultant force, F _x	67.562 kN
Resultant force, F _y	-163.109 kN
Resultant in X-Y plane	176.548 kN
Direction in X-Y plane	292.5°
Required bearing area	1.324 m ²
Inlet velocity	5.968 m/s
Outlet velocity	5.968 m/s

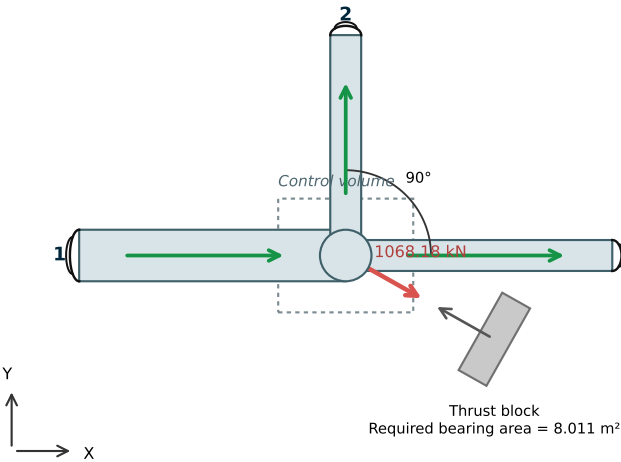


Thrust Block Design

T- / Y-piece - T-TB 1 - Chainage 245 m

Input data	
Internal pressure	18.5 bar
Flow rate, Q_1	950 l/s
Flow rate, Q_2	-600 l/s
Flow rate, Q_3	-350 l/s
Diameter, D_1	1000 mm
Diameter, D_2	600 mm
Diameter, D_3	600 mm
Branch angle	90°
Safety factor	1.5
Soil bearing capacity	200 kPa

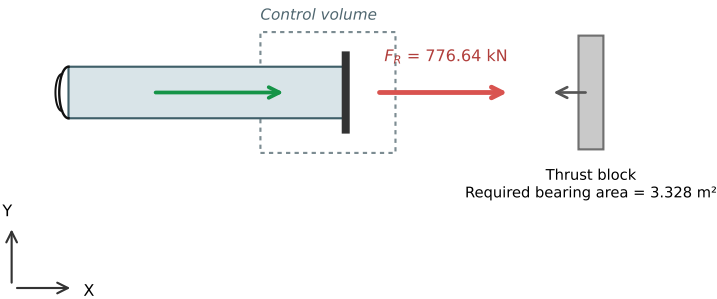
Results	
Resultant force, F_x	930.627 kN
Resultant force, F_y	-524.348 kN
Resultant in X-Y plane	1068.180 kN
Direction in X-Y plane	330.6°
Required bearing area	8.011 m ²



End cap - E-TB 1 - Chainage 12450m

Input data	
Internal pressure	280 m
Diameter	600 mm
Safety factor	1.5
Soil bearing capacity	350 kPa

Results	
Resultant force	776.639 kN
Required bearing area	3.328 m ²



Thrust Block Design



3-D bend - 3B-TB1 chaninage 4250 m

Input data	
Internal pressure	140 m
Flow rate, Q	0.1 m³/s
Inlet diameter, D ₁	300 mm
Outlet diameter, D ₂	200 mm
Horizontal inlet angle, α ₁	0°
Horizontal outlet angle, α ₂	90°
Vertical inlet angle, β ₁	30°
Vertical outlet angle, β ₂	-45°
Safety factor	1.0
Soil bearing capacity	400 kPa

Results	
Resultant force, F _x	84.196 kN
Resultant force, F _y	-30.734 kN
Resultant force, F _z	79.345 kN
Resultant in X-Y plane	89.630 kN
Direction in X-Y plane	339.9°
Total 3-D resultant	119.705 kN
Vertical restraining mass	8088 kg
Required bearing area	0.224 m²
Inlet velocity	1.415 m/s
Outlet velocity	3.183 m/s

