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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Network Type	Liquid	Calc. Method	Hazen
Description	ABF Fire Systems Newcastle		

A Fire water sprinkler system fed by a header tank. Minimum System pressure required at all nodes is 280kPa.
Hazen Williams calculation method has been used in order to comply with NFPA 13 (US National Fire Protection Agency) code of practice.

Node with lowest pressure is number 59 with 286.65kPa. This is known as the 'Hydraulically most remote node'.
Click Graphs tab below and click on the Node Gauge Pressure link to draw a bar graph of all node pressures in kPa.
Large pipe networks can be represented by a single offtake node (junction or nozzle) which is set with a consumption
flow rate of xx to represent the total demand for that whole section of network.

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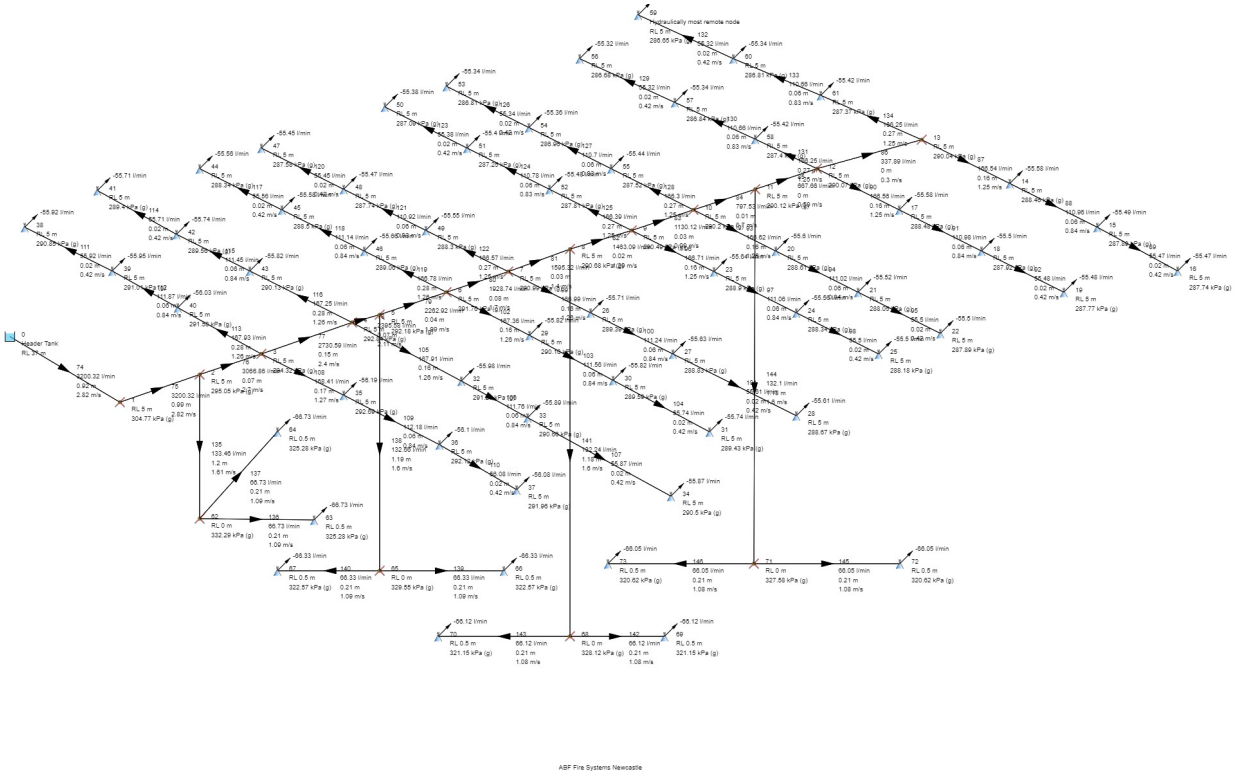
Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		



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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	74	From node to node	0 - 1
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	16 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	3200.32 l/min	Velocity	2.82 m/s
Friction Loss	0.92 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.92 m	Total Pressure Drop	9.04 kPa
Entry Total Head	37 m	Exit Total Head	36.08 m
Entry Gauge Head	0 m	Exit Gauge Head	31.08 m
Reynolds No.	432971.66	Friction Factor	0.02214 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	75	From node to node	1 - 2
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	17.2 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	3200.32 l/min	Velocity	2.82 m/s
Friction Loss	0.99 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.99 m	Total Pressure Drop	9.72 kPa
Entry Total Head	36.08 m	Exit Total Head	35.09 m
Entry Gauge Head	31.08 m	Exit Gauge Head	30.09 m
Reynolds No.	432971.63	Friction Factor	0.02214 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	76	From node to node	2 - 3
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	1.4 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	3066.86 l/min	Velocity	2.7 m/s
Friction Loss	0.07 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.07 m	Total Pressure Drop	0.73 kPa
Entry Total Head	35.09 m	Exit Total Head	35.01 m
Entry Gauge Head	30.09 m	Exit Gauge Head	30.01 m
Reynolds No.	414915.83	Friction Factor	0.02228 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	77	From node to node	3 - 4
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	3.5 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	2730.59 l/min	Velocity	2.4 m/s
Friction Loss	0.15 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.15 m	Total Pressure Drop	1.47 kPa
Entry Total Head	35.01 m	Exit Total Head	34.86 m
Entry Gauge Head	30.01 m	Exit Gauge Head	29.86 m
Reynolds No.	369421.82	Friction Factor	0.02267 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	78	From node to node	4 - 5
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	2 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	2395.58 l/min	Velocity	2.11 m/s
Friction Loss	0.07 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.07 m	Total Pressure Drop	0.66 kPa
Entry Total Head	34.86 m	Exit Total Head	34.79 m
Entry Gauge Head	29.86 m	Exit Gauge Head	29.79 m
Reynolds No.	324098.25	Friction Factor	0.02311 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	79	From node to node	5 - 6
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	1.4 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	2262.92 l/min	Velocity	1.99 m/s
Friction Loss	0.04 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.04 m	Total Pressure Drop	0.42 kPa
Entry Total Head	34.79 m	Exit Total Head	34.75 m
Entry Gauge Head	29.79 m	Exit Gauge Head	29.75 m
Reynolds No.	306150.75	Friction Factor	0.02331 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	80	From node to node	6 - 7
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	3.5 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1928.74 l/min	Velocity	1.7 m/s
Friction Loss	0.08 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.08 m	Total Pressure Drop	0.77 kPa
Entry Total Head	34.75 m	Exit Total Head	34.67 m
Entry Gauge Head	29.75 m	Exit Gauge Head	29.67 m
Reynolds No.	260939.45	Friction Factor	0.02387 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	81	From node to node	7 - 8
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	2 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1595.32 l/min	Velocity	1.4 m/s
Friction Loss	0.03 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.03 m	Total Pressure Drop	0.31 kPa
Entry Total Head	34.67 m	Exit Total Head	34.64 m
Entry Gauge Head	29.67 m	Exit Gauge Head	29.64 m
Reynolds No.	215831.14	Friction Factor	0.02455 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	82	From node to node	8 - 9
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	1.4 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1463.09 l/min	Velocity	1.29 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.19 kPa
Entry Total Head	34.64 m	Exit Total Head	34.62 m
Entry Gauge Head	29.64 m	Exit Gauge Head	29.62 m
Reynolds No.	197941.91	Friction Factor	0.02486 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	83	From node to node	9 - 10
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	3.5 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1130.12 l/min	Velocity	0.99 m/s
Friction Loss	0.03 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.03 m	Total Pressure Drop	0.29 kPa
Entry Total Head	34.62 m	Exit Total Head	34.59 m
Entry Gauge Head	29.62 m	Exit Gauge Head	29.59 m
Reynolds No.	152893.53	Friction Factor	0.02583 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	84	From node to node	10 - 11
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	2 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	797.53 l/min	Velocity	0.7 m/s
Friction Loss	0.01 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.01 m	Total Pressure Drop	0.09 kPa
Entry Total Head	34.59 m	Exit Total Head	34.58 m
Entry Gauge Head	29.59 m	Exit Gauge Head	29.58 m
Reynolds No.	107898.14	Friction Factor	0.0272 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	85	From node to node	11 - 12
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	1.4 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	667.66 l/min	Velocity	0.59 m/s
Friction Loss	0 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0 m	Total Pressure Drop	0.04 kPa
Entry Total Head	34.58 m	Exit Total Head	34.58 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.58 m
Reynolds No.	90328.28	Friction Factor	0.02793 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	86	From node to node	12 - 13
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	150 mm	Inside Diameter	155.3 mm
Outside Diameter	165.1 mm	Pipe Length	3.5 m
Pipe Roughness	120 mm	Allowable Press.	690 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	337.89 l/min	Velocity	0.3 m/s
Friction Loss	0 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0 m	Total Pressure Drop	0.03 kPa
Entry Total Head	34.58 m	Exit Total Head	34.58 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.58 m
Reynolds No.	45713.66	Friction Factor	0.03089 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	87	From node to node	13 - 14
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.54 l/min	Velocity	1.25 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.59 kPa
Entry Total Head	34.58 m	Exit Total Head	34.41 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.41 m
Reynolds No.	65896.38	Friction Factor	0.02984 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	88	From node to node	14 - 15
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.96 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.41 m	Exit Total Head	34.36 m
Entry Gauge Head	29.41 m	Exit Gauge Head	29.36 m
Reynolds No.	43904.55	Friction Factor	0.03169 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	89	From node to node	15 - 16
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.47 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.36 m	Exit Total Head	34.34 m
Entry Gauge Head	29.36 m	Exit Gauge Head	29.34 m
Reynolds No.	21948.64	Friction Factor	0.03512 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	90	From node to node	12 - 17
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.56 l/min	Velocity	1.25 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.59 kPa
Entry Total Head	34.58 m	Exit Total Head	34.42 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.42 m
Reynolds No.	65904.34	Friction Factor	0.02984 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	91	From node to node	17 - 18
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.98 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.42 m	Exit Total Head	34.36 m
Entry Gauge Head	29.42 m	Exit Gauge Head	29.36 m
Reynolds No.	43912.46	Friction Factor	0.03169 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	92	From node to node	18 - 19
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.48 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.36 m	Exit Total Head	34.34 m
Entry Gauge Head	29.36 m	Exit Gauge Head	29.34 m
Reynolds No.	21952.6	Friction Factor	0.03512 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	93	From node to node	10 - 20
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.62 l/min	Velocity	1.25 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.59 kPa
Entry Total Head	34.59 m	Exit Total Head	34.43 m
Entry Gauge Head	29.59 m	Exit Gauge Head	29.43 m
Reynolds No.	65929.06	Friction Factor	0.02984 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	94	From node to node	20 - 21
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.02 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.43 m	Exit Total Head	34.37 m
Entry Gauge Head	29.43 m	Exit Gauge Head	29.37 m
Reynolds No.	43928.29	Friction Factor	0.03169 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	95	From node to node	21 - 22
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.5 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.37 m	Exit Total Head	34.36 m
Entry Gauge Head	29.37 m	Exit Gauge Head	29.36 m
Reynolds No.	21960.51	Friction Factor	0.03512 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	96	From node to node	9 - 23
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.71 l/min	Velocity	1.25 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.59 kPa
Entry Total Head	34.62 m	Exit Total Head	34.46 m
Entry Gauge Head	29.62 m	Exit Gauge Head	29.46 m
Reynolds No.	65963.87	Friction Factor	0.02984 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	97	From node to node	23 - 24
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.06 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.46 m	Exit Total Head	34.4 m
Entry Gauge Head	29.46 m	Exit Gauge Head	29.4 m
Reynolds No.	43944.12	Friction Factor	0.03169 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	98	From node to node	24 - 25
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.5 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.4 m	Exit Total Head	34.39 m
Entry Gauge Head	29.4 m	Exit Gauge Head	29.39 m
Reynolds No.	21960.51	Friction Factor	0.03512 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	99	From node to node	7 - 26
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.99 l/min	Velocity	1.26 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.6 kPa
Entry Total Head	34.67 m	Exit Total Head	34.51 m
Entry Gauge Head	29.67 m	Exit Gauge Head	29.51 m
Reynolds No.	66074.26	Friction Factor	0.02983 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	100	From node to node	26 - 27
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.24 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.51 m	Exit Total Head	34.45 m
Entry Gauge Head	29.51 m	Exit Gauge Head	29.45 m
Reynolds No.	44015.34	Friction Factor	0.03168 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	101	From node to node	27 - 28
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.61 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.45 m	Exit Total Head	34.44 m
Entry Gauge Head	29.45 m	Exit Gauge Head	29.44 m
Reynolds No.	22004.04	Friction Factor	0.03511 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	102	From node to node	6 - 29
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	167.36 l/min	Velocity	1.26 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.6 kPa
Entry Total Head	34.75 m	Exit Total Head	34.59 m
Entry Gauge Head	29.75 m	Exit Gauge Head	29.59 m
Reynolds No.	66221.2	Friction Factor	0.02982 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	103	From node to node	29 - 30
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.56 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.57 kPa
Entry Total Head	34.59 m	Exit Total Head	34.53 m
Entry Gauge Head	29.59 m	Exit Gauge Head	29.53 m
Reynolds No.	44141.96	Friction Factor	0.03167 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	104	From node to node	30 - 31
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.74 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.53 m	Exit Total Head	34.51 m
Entry Gauge Head	29.53 m	Exit Gauge Head	29.51 m
Reynolds No.	22055.48	Friction Factor	0.03509 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	105	From node to node	4 - 32
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	167.91 l/min	Velocity	1.26 m/s
Friction Loss	0.16 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.16 m	Total Pressure Drop	1.61 kPa
Entry Total Head	34.86 m	Exit Total Head	34.7 m
Entry Gauge Head	29.86 m	Exit Gauge Head	29.7 m
Reynolds No.	66438.27	Friction Factor	0.0298 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	106	From node to node	32 - 33
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.76 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.57 kPa
Entry Total Head	34.7 m	Exit Total Head	34.64 m
Entry Gauge Head	29.7 m	Exit Gauge Head	29.64 m
Reynolds No.	44221.09	Friction Factor	0.03166 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	107	From node to node	33 - 34
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.87 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.64 m	Exit Total Head	34.62 m
Entry Gauge Head	29.64 m	Exit Gauge Head	29.62 m
Reynolds No.	22106.93	Friction Factor	0.03508 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	108	From node to node	3 - 35
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	3.6 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	168.41 l/min	Velocity	1.27 m/s
Friction Loss	0.17 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.17 m	Total Pressure Drop	1.62 kPa
Entry Total Head	35.01 m	Exit Total Head	34.85 m
Entry Gauge Head	30.01 m	Exit Gauge Head	29.85 m
Reynolds No.	66635.46	Friction Factor	0.02979 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	109	From node to node	35 - 36
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	112.18 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.57 kPa
Entry Total Head	34.85 m	Exit Total Head	34.79 m
Entry Gauge Head	29.85 m	Exit Gauge Head	29.79 m
Reynolds No.	44387.28	Friction Factor	0.03164 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	110	From node to node	36 - 37
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	56.08 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.79 m	Exit Total Head	34.77 m
Entry Gauge Head	29.79 m	Exit Gauge Head	29.77 m
Reynolds No.	22190.02	Friction Factor	0.03506 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	111	From node to node	39 - 38
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.92 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.67 m	Exit Total Head	34.66 m
Entry Gauge Head	29.67 m	Exit Gauge Head	29.66 m
Reynolds No.	22126.54	Friction Factor	0.03508 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	112	From node to node	40 - 39
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.87 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.57 kPa
Entry Total Head	34.73 m	Exit Total Head	34.67 m
Entry Gauge Head	29.73 m	Exit Gauge Head	29.67 m
Reynolds No.	44264.61	Friction Factor	0.03165 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	113	From node to node	3 - 40
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	167.93 l/min	Velocity	1.26 m/s
Friction Loss	0.28 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.28 m	Total Pressure Drop	2.73 kPa
Entry Total Head	35.01 m	Exit Total Head	34.73 m
Entry Gauge Head	30.01 m	Exit Gauge Head	29.73 m
Reynolds No.	66446.79	Friction Factor	0.0298 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	114	From node to node	42 - 41
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.71 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.53 m	Exit Total Head	34.51 m
Entry Gauge Head	29.53 m	Exit Gauge Head	29.51 m
Reynolds No.	22043.45	Friction Factor	0.0351 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	115	From node to node	43 - 42
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.45 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.57 kPa
Entry Total Head	34.58 m	Exit Total Head	34.53 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.53 m
Reynolds No.	44098.42	Friction Factor	0.03167 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	116	From node to node	4 - 43
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	167.25 l/min	Velocity	1.26 m/s
Friction Loss	0.28 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.28 m	Total Pressure Drop	2.71 kPa
Entry Total Head	34.86 m	Exit Total Head	34.58 m
Entry Gauge Head	29.86 m	Exit Gauge Head	29.58 m
Reynolds No.	66176.02	Friction Factor	0.02982 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	117	From node to node	45 - 44
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.56 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.42 m	Exit Total Head	34.4 m
Entry Gauge Head	29.42 m	Exit Gauge Head	29.4 m
Reynolds No.	21984.1	Friction Factor	0.03511 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	118	From node to node	46 - 45
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	111.14 l/min	Velocity	0.84 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.48 m	Exit Total Head	34.42 m
Entry Gauge Head	29.48 m	Exit Gauge Head	29.42 m
Reynolds No.	43975.76	Friction Factor	0.03168 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	119	From node to node	6 - 46
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.78 l/min	Velocity	1.26 m/s
Friction Loss	0.28 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.28 m	Total Pressure Drop	2.7 kPa
Entry Total Head	34.75 m	Exit Total Head	34.48 m
Entry Gauge Head	29.75 m	Exit Gauge Head	29.48 m
Reynolds No.	65989.69	Friction Factor	0.02983 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	120	From node to node	48 - 47
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.45 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.34 m	Exit Total Head	34.33 m
Entry Gauge Head	29.34 m	Exit Gauge Head	29.33 m
Reynolds No.	21940.57	Friction Factor	0.03512 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	121	From node to node	49 - 48
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.92 l/min	Velocity	0.83 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.4 m	Exit Total Head	34.34 m
Entry Gauge Head	29.4 m	Exit Gauge Head	29.34 m
Reynolds No.	43888.71	Friction Factor	0.03169 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	122	From node to node	7 - 49
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.57 l/min	Velocity	1.25 m/s
Friction Loss	0.27 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.27 m	Total Pressure Drop	2.69 kPa
Entry Total Head	34.67 m	Exit Total Head	34.4 m
Entry Gauge Head	29.67 m	Exit Gauge Head	29.4 m
Reynolds No.	65908.07	Friction Factor	0.02984 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	123	From node to node	51 - 50
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.38 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.16 kPa
Entry Total Head	34.29 m	Exit Total Head	34.28 m
Entry Gauge Head	29.29 m	Exit Gauge Head	29.28 m
Reynolds No.	21912.87	Friction Factor	0.03513 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	124	From node to node	52 - 51
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.78 l/min	Velocity	0.83 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.35 m	Exit Total Head	34.29 m
Entry Gauge Head	29.35 m	Exit Gauge Head	29.29 m
Reynolds No.	43833.32	Friction Factor	0.0317 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	125	From node to node	9 - 52
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.39 l/min	Velocity	1.25 m/s
Friction Loss	0.27 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.27 m	Total Pressure Drop	2.68 kPa
Entry Total Head	34.62 m	Exit Total Head	34.35 m
Entry Gauge Head	29.62 m	Exit Gauge Head	29.35 m
Reynolds No.	65835.91	Friction Factor	0.02984 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	126	From node to node	54 - 53
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.34 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.15 kPa
Entry Total Head	34.26 m	Exit Total Head	34.25 m
Entry Gauge Head	29.26 m	Exit Gauge Head	29.25 m
Reynolds No.	21897.05	Friction Factor	0.03513 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	127	From node to node	55 - 54
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.7 l/min	Velocity	0.83 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.32 m	Exit Total Head	34.26 m
Entry Gauge Head	29.32 m	Exit Gauge Head	29.26 m
Reynolds No.	43801.66	Friction Factor	0.0317 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	128	From node to node	10 - 55
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.3 l/min	Velocity	1.25 m/s
Friction Loss	0.27 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.27 m	Total Pressure Drop	2.68 kPa
Entry Total Head	34.59 m	Exit Total Head	34.32 m
Entry Gauge Head	29.59 m	Exit Gauge Head	29.32 m
Reynolds No.	65800.62	Friction Factor	0.02985 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	129	From node to node	57 - 56
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.32 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.15 kPa
Entry Total Head	34.25 m	Exit Total Head	34.23 m
Entry Gauge Head	29.25 m	Exit Gauge Head	29.23 m
Reynolds No.	21889.13	Friction Factor	0.03513 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	130	From node to node	58 - 57
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.66 l/min	Velocity	0.83 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.31 m	Exit Total Head	34.25 m
Entry Gauge Head	29.31 m	Exit Gauge Head	29.25 m
Reynolds No.	43785.84	Friction Factor	0.0317 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	131	From node to node	12 - 58
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.25 l/min	Velocity	1.25 m/s
Friction Loss	0.27 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.27 m	Total Pressure Drop	2.68 kPa
Entry Total Head	34.58 m	Exit Total Head	34.31 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.31 m
Reynolds No.	65779.9	Friction Factor	0.02985 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	132	From node to node	60 - 59
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	55.32 l/min	Velocity	0.42 m/s
Friction Loss	0.02 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.02 m	Total Pressure Drop	0.15 kPa
Entry Total Head	34.25 m	Exit Total Head	34.23 m
Entry Gauge Head	29.25 m	Exit Gauge Head	29.23 m
Reynolds No.	21889.13	Friction Factor	0.03513 (Darcy f)

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	133	From node to node	61 - 60
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	2.7 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	110.66 l/min	Velocity	0.83 m/s
Friction Loss	0.06 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.06 m	Total Pressure Drop	0.56 kPa
Entry Total Head	34.3 m	Exit Total Head	34.25 m
Entry Gauge Head	29.3 m	Exit Gauge Head	29.25 m
Reynolds No.	43785.84	Friction Factor	0.0317 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	134	From node to node	13 - 61
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	50 mm	Inside Diameter	53.1 mm
Outside Diameter	60.3 mm	Pipe Length	6.1 m
Pipe Roughness	120 mm	Allowable Press.	860 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	166.25 l/min	Velocity	1.25 m/s
Friction Loss	0.27 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.27 m	Total Pressure Drop	2.68 kPa
Entry Total Head	34.58 m	Exit Total Head	34.3 m
Entry Gauge Head	29.58 m	Exit Gauge Head	29.3 m
Reynolds No.	65780.28	Friction Factor	0.02985 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	135	From node to node	2 - 62
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	40 mm	Inside Diameter	41.9 mm
Outside Diameter	48.3 mm	Pipe Length	12.7 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	133.46 l/min	Velocity	1.61 m/s
Friction Loss	1.2 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.2 m	Total Pressure Drop	11.79 kPa
Entry Total Head	35.09 m	Exit Total Head	33.88 m
Entry Gauge Head	30.09 m	Exit Gauge Head	33.88 m
Reynolds No.	66922.32	Friction Factor	0.0299 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	136	From node to node	62 - 63
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.73 l/min	Velocity	1.09 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.1 kPa
Entry Total Head	33.88 m	Exit Total Head	33.67 m
Entry Gauge Head	33.88 m	Exit Gauge Head	33.17 m
Reynolds No.	38945.4	Friction Factor	0.03249 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	137	From node to node	62 - 64
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.73 l/min	Velocity	1.09 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.1 kPa
Entry Total Head	33.88 m	Exit Total Head	33.67 m
Entry Gauge Head	33.88 m	Exit Gauge Head	33.17 m
Reynolds No.	38945.4	Friction Factor	0.03249 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	138	From node to node	5 - 65
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	40 mm	Inside Diameter	41.9 mm
Outside Diameter	48.3 mm	Pipe Length	12.7 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	132.66 l/min	Velocity	1.6 m/s
Friction Loss	1.19 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.19 m	Total Pressure Drop	11.66 kPa
Entry Total Head	34.79 m	Exit Total Head	33.6 m
Entry Gauge Head	29.79 m	Exit Gauge Head	33.6 m
Reynolds No.	66521.66	Friction Factor	0.02993 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	139	From node to node	65 - 66
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.33 l/min	Velocity	1.09 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.08 kPa
Entry Total Head	33.6 m	Exit Total Head	33.39 m
Entry Gauge Head	33.6 m	Exit Gauge Head	32.89 m
Reynolds No.	38711.94	Friction Factor	0.03252 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	140	From node to node	65 - 67
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.33 l/min	Velocity	1.09 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.08 kPa
Entry Total Head	33.6 m	Exit Total Head	33.39 m
Entry Gauge Head	33.6 m	Exit Gauge Head	32.89 m
Reynolds No.	38711.95	Friction Factor	0.03252 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	141	From node to node	8 - 68
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	40 mm	Inside Diameter	41.9 mm
Outside Diameter	48.3 mm	Pipe Length	12.7 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	132.24 l/min	Velocity	1.6 m/s
Friction Loss	1.18 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.18 m	Total Pressure Drop	11.59 kPa
Entry Total Head	34.64 m	Exit Total Head	33.46 m
Entry Gauge Head	29.64 m	Exit Gauge Head	33.46 m
Reynolds No.	66311.18	Friction Factor	0.02994 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	142	From node to node	68 - 69
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.12 l/min	Velocity	1.08 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.07 kPa
Entry Total Head	33.46 m	Exit Total Head	33.25 m
Entry Gauge Head	33.46 m	Exit Gauge Head	32.75 m
Reynolds No.	38589.38	Friction Factor	0.03253 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	143	From node to node	68 - 70
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.12 l/min	Velocity	1.08 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.07 kPa
Entry Total Head	33.46 m	Exit Total Head	33.25 m
Entry Gauge Head	33.46 m	Exit Gauge Head	32.75 m
Reynolds No.	38589.38	Friction Factor	0.03253 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	144	From node to node	11 - 71
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	40 mm	Inside Diameter	41.9 mm
Outside Diameter	48.3 mm	Pipe Length	12.7 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	132.1 l/min	Velocity	1.6 m/s
Friction Loss	1.18 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.18 m	Total Pressure Drop	11.57 kPa
Entry Total Head	34.58 m	Exit Total Head	33.4 m
Entry Gauge Head	29.58 m	Exit Gauge Head	33.4 m
Reynolds No.	66241.02	Friction Factor	0.02995 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	145	From node to node	71 - 72
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.05 l/min	Velocity	1.08 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.06 kPa
Entry Total Head	33.4 m	Exit Total Head	33.19 m
Entry Gauge Head	33.4 m	Exit Gauge Head	32.69 m
Reynolds No.	38548.53	Friction Factor	0.03254 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Pipe No	146	From node to node	71 - 73
Description		Equipment No	
Liquid	Water	Viscosity	1.01 cp
Temperature	20 C	Density	1000 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel Pipe AS1074 - Medium	Pipe Class	M
Nominal Diameter	32 mm	Inside Diameter	36 mm
Outside Diameter	42.4 mm	Pipe Length	3.9 m
Pipe Roughness	120 mm	Allowable Press.	1030 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	66.05 l/min	Velocity	1.08 m/s
Friction Loss	0.21 m	Fitting Losses	0 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.21 m	Total Pressure Drop	2.06 kPa
Entry Total Head	33.4 m	Exit Total Head	33.19 m
Entry Gauge Head	33.4 m	Exit Gauge Head	32.69 m
Reynolds No.	38548.53	Friction Factor	0.03254 (Darcy f)

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	0	Node Type	Tank
Description	Header Tank	Equipment No	
Rel. Level (RL)	37 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	37 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	1	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	31.08 m	Int.(Gauge) Pressure	304.77 kPa
Total Node Head	36.08 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	2	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	30.09 m	Int.(Gauge) Pressure	295.05 kPa
Total Node Head	35.09 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	3	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	30.01 m	Int.(Gauge) Pressure	294.32 kPa
Total Node Head	35.01 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	4	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.86 m	Int.(Gauge) Pressure	292.84 kPa
Total Node Head	34.86 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	5	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.79 m	Int.(Gauge) Pressure	292.18 kPa
Total Node Head	34.79 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	6	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.75 m	Int.(Gauge) Pressure	291.76 kPa
Total Node Head	34.75 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	7	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.67 m	Int.(Gauge) Pressure	290.99 kPa
Total Node Head	34.67 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	8	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.64 m	Int.(Gauge) Pressure	290.68 kPa
Total Node Head	34.64 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	9	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.62 m	Int.(Gauge) Pressure	290.49 kPa
Total Node Head	34.62 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	10	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.59 m	Int.(Gauge) Pressure	290.2 kPa
Total Node Head	34.59 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	11	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.58 m	Int.(Gauge) Pressure	290.12 kPa
Total Node Head	34.58 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	12	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.58 m	Int.(Gauge) Pressure	290.07 kPa
Total Node Head	34.58 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	13	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	29.58 m	Int.(Gauge) Pressure	290.04 kPa
Total Node Head	34.58 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	14	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.58 l/min
Int.(Gauge) Head	29.41 m	Int.(Gauge) Pressure	288.46 kPa
Total Node Head	34.41 m		

Helix Technologies Pty Ltd

Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	15	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.49 l/min
Int.(Gauge) Head	29.36 m	Int.(Gauge) Pressure	287.89 kPa
Total Node Head	34.36 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	16	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.47 l/min
Int.(Gauge) Head	29.34 m	Int.(Gauge) Pressure	287.74 kPa
Total Node Head	34.34 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	17	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.58 l/min
Int.(Gauge) Head	29.42 m	Int.(Gauge) Pressure	288.48 kPa
Total Node Head	34.42 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	18	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.5 l/min
Int.(Gauge) Head	29.36 m	Int.(Gauge) Pressure	287.92 kPa
Total Node Head	34.36 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	19	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.48 l/min
Int.(Gauge) Head	29.34 m	Int.(Gauge) Pressure	287.77 kPa
Total Node Head	34.34 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	20	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.6 l/min
Int.(Gauge) Head	29.43 m	Int.(Gauge) Pressure	288.61 kPa
Total Node Head	34.43 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	21	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.52 l/min
Int.(Gauge) Head	29.37 m	Int.(Gauge) Pressure	288.05 kPa
Total Node Head	34.37 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	22	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.5 l/min
Int.(Gauge) Head	29.36 m	Int.(Gauge) Pressure	287.89 kPa
Total Node Head	34.36 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	23	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.64 l/min
Int.(Gauge) Head	29.46 m	Int.(Gauge) Pressure	288.9 kPa
Total Node Head	34.46 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	24	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.56 l/min
Int.(Gauge) Head	29.4 m	Int.(Gauge) Pressure	288.34 kPa
Total Node Head	34.4 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	25	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.5 l/min
Int.(Gauge) Head	29.39 m	Int.(Gauge) Pressure	288.18 kPa
Total Node Head	34.39 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	26	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.71 l/min
Int.(Gauge) Head	29.51 m	Int.(Gauge) Pressure	289.39 kPa
Total Node Head	34.51 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	27	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.63 l/min
Int.(Gauge) Head	29.45 m	Int.(Gauge) Pressure	288.83 kPa
Total Node Head	34.45 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	28	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.61 l/min
Int.(Gauge) Head	29.44 m	Int.(Gauge) Pressure	288.67 kPa
Total Node Head	34.44 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	29	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.82 l/min
Int.(Gauge) Head	29.59 m	Int.(Gauge) Pressure	290.16 kPa
Total Node Head	34.59 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	30	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.82 l/min
Int.(Gauge) Head	29.53 m	Int.(Gauge) Pressure	289.59 kPa
Total Node Head	34.53 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	31	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.74 l/min
Int.(Gauge) Head	29.51 m	Int.(Gauge) Pressure	289.43 kPa
Total Node Head	34.51 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	32	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.98 l/min
Int.(Gauge) Head	29.7 m	Int.(Gauge) Pressure	291.23 kPa
Total Node Head	34.7 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	33	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.89 l/min
Int.(Gauge) Head	29.64 m	Int.(Gauge) Pressure	290.66 kPa
Total Node Head	34.64 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	34	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.87 l/min
Int.(Gauge) Head	29.62 m	Int.(Gauge) Pressure	290.5 kPa
Total Node Head	34.62 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	35	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-56.19 l/min
Int.(Gauge) Head	29.85 m	Int.(Gauge) Pressure	292.69 kPa
Total Node Head	34.85 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	36	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-56.1 l/min
Int.(Gauge) Head	29.79 m	Int.(Gauge) Pressure	292.12 kPa
Total Node Head	34.79 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	37	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-56.08 l/min
Int.(Gauge) Head	29.77 m	Int.(Gauge) Pressure	291.96 kPa
Total Node Head	34.77 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	38	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.92 l/min
Int.(Gauge) Head	29.66 m	Int.(Gauge) Pressure	290.85 kPa
Total Node Head	34.66 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	39	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.95 l/min
Int.(Gauge) Head	29.67 m	Int.(Gauge) Pressure	291.01 kPa
Total Node Head	34.67 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	40	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-56.03 l/min
Int.(Gauge) Head	29.73 m	Int.(Gauge) Pressure	291.58 kPa
Total Node Head	34.73 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	41	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.71 l/min
Int.(Gauge) Head	29.51 m	Int.(Gauge) Pressure	289.4 kPa
Total Node Head	34.51 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	42	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.74 l/min
Int.(Gauge) Head	29.53 m	Int.(Gauge) Pressure	289.56 kPa
Total Node Head	34.53 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	43	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.82 l/min
Int.(Gauge) Head	29.58 m	Int.(Gauge) Pressure	290.13 kPa
Total Node Head	34.58 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	44	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.56 l/min
Int.(Gauge) Head	29.4 m	Int.(Gauge) Pressure	288.34 kPa
Total Node Head	34.4 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	45	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.58 l/min
Int.(Gauge) Head	29.42 m	Int.(Gauge) Pressure	288.5 kPa
Total Node Head	34.42 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	46	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.66 l/min
Int.(Gauge) Head	29.48 m	Int.(Gauge) Pressure	289.06 kPa
Total Node Head	34.48 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	47	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.45 l/min
Int.(Gauge) Head	29.33 m	Int.(Gauge) Pressure	287.58 kPa
Total Node Head	34.33 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	48	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.47 l/min
Int.(Gauge) Head	29.34 m	Int.(Gauge) Pressure	287.74 kPa
Total Node Head	34.34 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	49	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.55 l/min
Int.(Gauge) Head	29.4 m	Int.(Gauge) Pressure	288.3 kPa
Total Node Head	34.4 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	50	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.38 l/min
Int.(Gauge) Head	29.28 m	Int.(Gauge) Pressure	287.09 kPa
Total Node Head	34.28 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	51	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.4 l/min
Int.(Gauge) Head	29.29 m	Int.(Gauge) Pressure	287.25 kPa
Total Node Head	34.29 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	52	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.48 l/min
Int.(Gauge) Head	29.35 m	Int.(Gauge) Pressure	287.81 kPa
Total Node Head	34.35 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	53	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.34 l/min
Int.(Gauge) Head	29.25 m	Int.(Gauge) Pressure	286.81 kPa
Total Node Head	34.25 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	54	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.36 l/min
Int.(Gauge) Head	29.26 m	Int.(Gauge) Pressure	286.96 kPa
Total Node Head	34.26 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	55	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.44 l/min
Int.(Gauge) Head	29.32 m	Int.(Gauge) Pressure	287.52 kPa
Total Node Head	34.32 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	56	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.32 l/min
Int.(Gauge) Head	29.23 m	Int.(Gauge) Pressure	286.68 kPa
Total Node Head	34.23 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	57	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.34 l/min
Int.(Gauge) Head	29.25 m	Int.(Gauge) Pressure	286.84 kPa
Total Node Head	34.25 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	58	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.42 l/min
Int.(Gauge) Head	29.31 m	Int.(Gauge) Pressure	287.4 kPa
Total Node Head	34.31 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	59	Node Type	Nozzle
Description	Hydraulically most remote node	Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.32 l/min
Int.(Gauge) Head	29.23 m	Int.(Gauge) Pressure	286.65 kPa
Total Node Head	34.23 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	60	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.34 l/min
Int.(Gauge) Head	29.25 m	Int.(Gauge) Pressure	286.81 kPa
Total Node Head	34.25 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	61	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-55.42 l/min
Int.(Gauge) Head	29.3 m	Int.(Gauge) Pressure	287.37 kPa
Total Node Head	34.3 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	62	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	33.88 m	Int.(Gauge) Pressure	332.29 kPa
Total Node Head	33.88 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	63	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.73 l/min
Int.(Gauge) Head	33.17 m	Int.(Gauge) Pressure	325.28 kPa
Total Node Head	33.67 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	64	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.73 l/min
Int.(Gauge) Head	33.17 m	Int.(Gauge) Pressure	325.28 kPa
Total Node Head	33.67 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	65	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	33.6 m	Int.(Gauge) Pressure	329.55 kPa
Total Node Head	33.6 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	66	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.33 l/min
Int.(Gauge) Head	32.89 m	Int.(Gauge) Pressure	322.57 kPa
Total Node Head	33.39 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	67	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.33 l/min
Int.(Gauge) Head	32.89 m	Int.(Gauge) Pressure	322.57 kPa
Total Node Head	33.39 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	68	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	33.46 m	Int.(Gauge) Pressure	328.12 kPa
Total Node Head	33.46 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	69	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.12 l/min
Int.(Gauge) Head	32.75 m	Int.(Gauge) Pressure	321.15 kPa
Total Node Head	33.25 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	70	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.12 l/min
Int.(Gauge) Head	32.75 m	Int.(Gauge) Pressure	321.15 kPa
Total Node Head	33.25 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	71	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	33.4 m	Int.(Gauge) Pressure	327.58 kPa
Total Node Head	33.4 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	72	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.05 l/min
Int.(Gauge) Head	32.69 m	Int.(Gauge) Pressure	320.62 kPa
Total Node Head	33.19 m		

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Project	Petrol Station Newcastle	Client	ABF Fire Systems
Project No.	TTLR Foam Deluge	Design Date	23/01/2016
Category	Demo Fire Water System	Atmos. Press	0 kPa
Description	ABF Fire Systems Newcastle		

Node No	73	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-66.05 l/min
Int.(Gauge) Head	32.69 m	Int.(Gauge) Pressure	320.62 kPa
Total Node Head	33.19 m		