

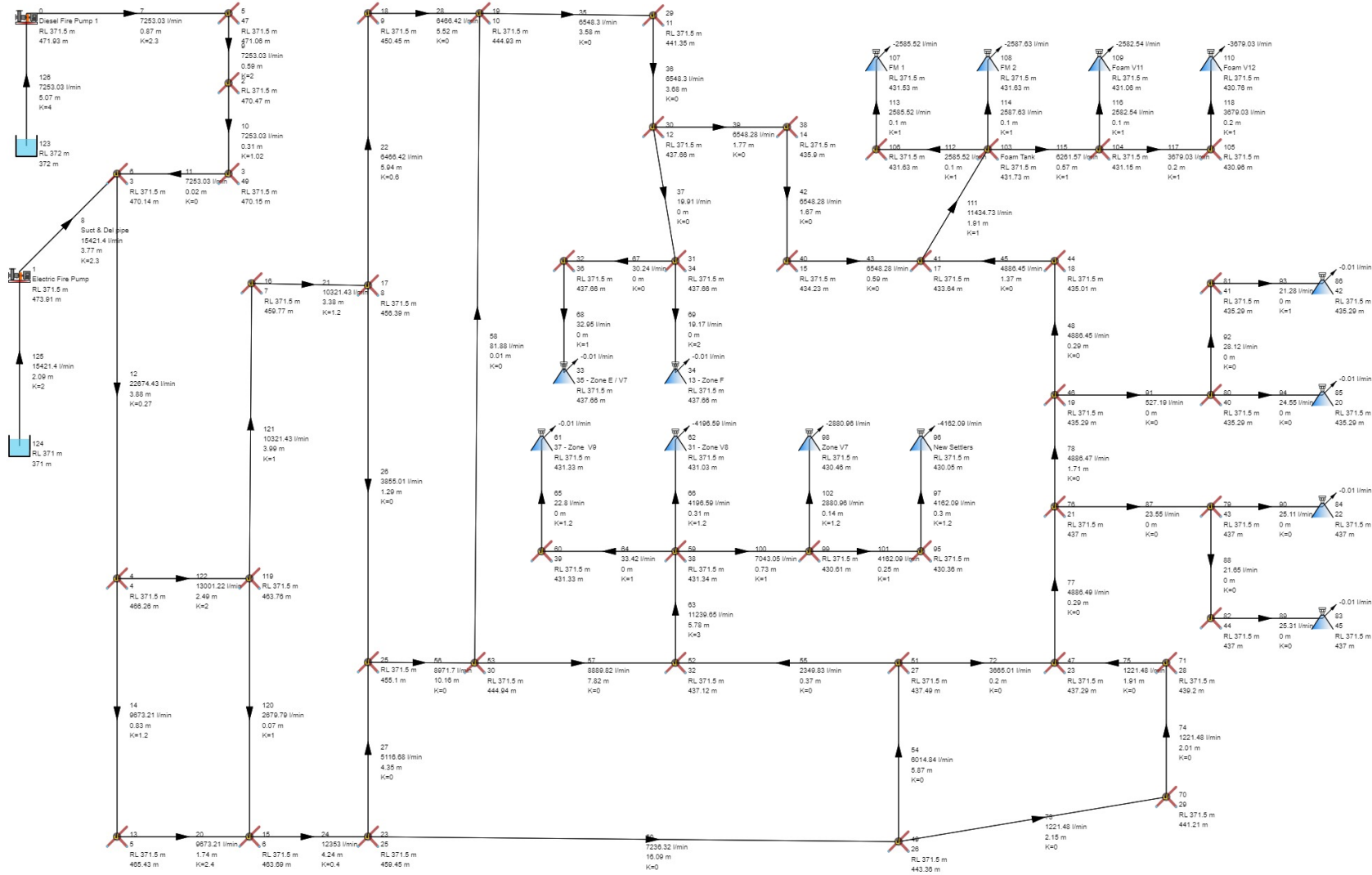
Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Network Type	Liquid	Calc. Method	Darcy
Description	A - Fire Water Distribution System		

Nickel HPAL Process plant fire protection system network. Audited by Insurance Co Loss Adjuster. Includes Foam deluge fire suppression system in Solvent Elution plant and water spinkler and high pressure monitor system with diesel fire pump back-up.

Project Nickel Project
 Project No. 18478
 Category Demo Large Network
 Description A - Fire Water Distribution System

Client ABC Mining
 Design Date 02/12/2016
 Atmos. Press 101.03 kPa



A - Fire Water Distribution System

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	7	From node to node	0 - 5
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	35 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2.3	Total Fittings kf	0
Flow Rate	7253.03 l/min	Velocity	2.07 m/s
Friction Loss	0.37 m	Fitting Losses	0.5 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.87 m	Total Pressure Drop	9.32 kPa
Entry Total Head	471.93 m	Exit Total Head	471.06 m
Entry Gauge Head	100.43 m	Exit Gauge Head	99.56 m
Reynolds No.	543830.85	Friction Factor	0.01334 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	8	From node to node	1 - 6
Description	Suct & Del pipe	Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	35 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2.3	Total Fittings kf	0
Flow Rate	15421.4 l/min	Velocity	4.39 m/s
Friction Loss	1.51 m	Fitting Losses	2.26 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	3.77 m	Total Pressure Drop	40.29 kPa
Entry Total Head	473.91 m	Exit Total Head	470.14 m
Entry Gauge Head	102.41 m	Exit Gauge Head	98.64 m
Reynolds No.	1156293.71	Friction Factor	0.01196 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	9	From node to node	5 - 2
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	250 mm	Inside Diameter	254.5 mm
Outside Diameter	273 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	7253.03 l/min	Velocity	2.38 m/s
Friction Loss	0.02 m	Fitting Losses	0.58 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.59 m	Total Pressure Drop	6.34 kPa
Entry Total Head	471.06 m	Exit Total Head	470.47 m
Entry Gauge Head	99.56 m	Exit Gauge Head	98.97 m
Reynolds No.	583362.75	Friction Factor	0.01501 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	10	From node to node	2 - 3
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	250 mm	Inside Diameter	254.5 mm
Outside Diameter	273 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.02	Total Fittings kf	0
Flow Rate	7253.03 l/min	Velocity	2.38 m/s
Friction Loss	0.02 m	Fitting Losses	0.29 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.31 m	Total Pressure Drop	3.32 kPa
Entry Total Head	470.47 m	Exit Total Head	470.15 m
Entry Gauge Head	98.97 m	Exit Gauge Head	98.65 m
Reynolds No.	583362.75	Friction Factor	0.01501 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	11	From node to node	6 - 3
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	250 mm	Inside Diameter	254.5 mm
Outside Diameter	273 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	7253.03 l/min	Velocity	2.38 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	0.18 kPa
Entry Total Head	470.15 m	Exit Total Head	470.14 m
Entry Gauge Head	98.64 m	Exit Gauge Head	98.62 m
Reynolds No.	583362.75	Friction Factor	0.01501 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	12	From node to node	6 - 4
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	4 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0.27	Total Fittings kf	0
Flow Rate	22674.43 l/min	Velocity	11.71 m/s
Friction Loss	1.99 m	Fitting Losses	1.89 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	3.88 m	Total Pressure Drop	41.49 kPa
Entry Total Head	470.14 m	Exit Total Head	466.26 m
Entry Gauge Head	98.64 m	Exit Gauge Head	94.76 m
Reynolds No.	2289758.29	Friction Factor	0.01444 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	14	From node to node	4 - 13
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	20 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	9673.21 l/min	Velocity	2.75 m/s
Friction Loss	0.36 m	Fitting Losses	0.46 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.83 m	Total Pressure Drop	8.83 kPa
Entry Total Head	466.26 m	Exit Total Head	465.43 m
Entry Gauge Head	94.76 m	Exit Gauge Head	93.93 m
Reynolds No.	725295.6	Friction Factor	0.01277 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	20	From node to node	13 - 15
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	45 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2.4	Total Fittings kf	0
Flow Rate	9673.21 l/min	Velocity	2.75 m/s
Friction Loss	0.81 m	Fitting Losses	0.93 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.74 m	Total Pressure Drop	18.63 kPa
Entry Total Head	465.43 m	Exit Total Head	463.69 m
Entry Gauge Head	93.93 m	Exit Gauge Head	92.19 m
Reynolds No.	725295.6	Friction Factor	0.01277 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	21	From node to node	16 - 17
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	140 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	10321.43 l/min	Velocity	2.94 m/s
Friction Loss	2.86 m	Fitting Losses	0.53 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	3.38 m	Total Pressure Drop	36.18 kPa
Entry Total Head	459.77 m	Exit Total Head	456.39 m
Entry Gauge Head	88.27 m	Exit Gauge Head	84.89 m
Reynolds No.	773899.11	Friction Factor	0.01264 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	22	From node to node	17 - 18
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	115 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0.6	Total Fittings kf	0
Flow Rate	6466.42 l/min	Velocity	3.72 m/s
Friction Loss	5.52 m	Fitting Losses	0.42 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	5.94 m	Total Pressure Drop	63.5 kPa
Entry Total Head	456.39 m	Exit Total Head	450.45 m
Entry Gauge Head	84.89 m	Exit Gauge Head	78.95 m
Reynolds No.	689397.73	Friction Factor	0.01303 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	24	From node to node	15 - 23
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE80 AS4130	Pipe Class	PN16
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	140 m
Pipe Roughness	0.007 mm	Allowable Press.	1600 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0.4	Total Fittings kf	0
Flow Rate	12353 l/min	Velocity	3.52 m/s
Friction Loss	3.99 m	Fitting Losses	0.25 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	4.24 m	Total Pressure Drop	45.32 kPa
Entry Total Head	463.69 m	Exit Total Head	459.45 m
Entry Gauge Head	92.19 m	Exit Gauge Head	87.95 m
Reynolds No.	926225.45	Friction Factor	0.01232 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	26	From node to node	25 - 17
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	70 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	3855.01 l/min	Velocity	2.22 m/s
Friction Loss	1.29 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	1.29 m	Total Pressure Drop	13.79 kPa
Entry Total Head	456.39 m	Exit Total Head	455.1 m
Entry Gauge Head	83.6 m	Exit Gauge Head	82.31 m
Reynolds No.	410990.07	Friction Factor	0.01409 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	27	From node to node	23 - 25
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	140 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	5116.68 l/min	Velocity	2.95 m/s
Friction Loss	4.35 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	4.35 m	Total Pressure Drop	46.5 kPa
Entry Total Head	459.45 m	Exit Total Head	455.1 m
Entry Gauge Head	87.95 m	Exit Gauge Head	83.6 m
Reynolds No.	545499.41	Friction Factor	0.01349 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	28	From node to node	18 - 19
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	115 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6466.42 l/min	Velocity	3.72 m/s
Friction Loss	5.52 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	5.52 m	Total Pressure Drop	58.97 kPa
Entry Total Head	450.45 m	Exit Total Head	444.93 m
Entry Gauge Head	78.95 m	Exit Gauge Head	73.43 m
Reynolds No.	689397.73	Friction Factor	0.01303 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	35	From node to node	19 - 29
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	73 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6548.3 l/min	Velocity	3.77 m/s
Friction Loss	3.58 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	3.58 m	Total Pressure Drop	38.32 kPa
Entry Total Head	444.93 m	Exit Total Head	441.35 m
Entry Gauge Head	73.43 m	Exit Gauge Head	69.85 m
Reynolds No.	698126.84	Friction Factor	0.01301 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	36	From node to node	29 - 30
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	75 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6548.3 l/min	Velocity	3.77 m/s
Friction Loss	3.68 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	3.68 m	Total Pressure Drop	39.37 kPa
Entry Total Head	441.35 m	Exit Total Head	437.66 m
Entry Gauge Head	69.85 m	Exit Gauge Head	66.16 m
Reynolds No.	698126.84	Friction Factor	0.01301 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	37	From node to node	30 - 31
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	33 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	19.91 l/min	Velocity	0.01 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 kPa
Entry Total Head	437.66 m	Exit Total Head	437.66 m
Entry Gauge Head	66.16 m	Exit Gauge Head	66.16 m
Reynolds No.	2122.3	Friction Factor	0.04854 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	39	From node to node	30 - 38
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	36 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6548.28 l/min	Velocity	3.77 m/s
Friction Loss	1.77 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	1.77 m	Total Pressure Drop	18.9 kPa
Entry Total Head	437.66 m	Exit Total Head	435.9 m
Entry Gauge Head	66.16 m	Exit Gauge Head	64.4 m
Reynolds No.	698124.71	Friction Factor	0.01301 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	42	From node to node	38 - 40
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	34 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6548.28 l/min	Velocity	3.77 m/s
Friction Loss	1.67 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	1.67 m	Total Pressure Drop	17.85 kPa
Entry Total Head	435.9 m	Exit Total Head	434.23 m
Entry Gauge Head	64.4 m	Exit Gauge Head	62.73 m
Reynolds No.	698124.71	Friction Factor	0.01301 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	43	From node to node	40 - 41
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	12 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6548.28 l/min	Velocity	3.77 m/s
Friction Loss	0.59 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	0.59 m	Total Pressure Drop	6.3 kPa
Entry Total Head	434.23 m	Exit Total Head	433.64 m
Entry Gauge Head	62.73 m	Exit Gauge Head	62.14 m
Reynolds No.	698124.71	Friction Factor	0.01301 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	45	From node to node	44 - 41
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	48 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	4886.45 l/min	Velocity	2.81 m/s
Friction Loss	1.37 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	1.37 m	Total Pressure Drop	14.64 kPa
Entry Total Head	435.01 m	Exit Total Head	433.64 m
Entry Gauge Head	63.51 m	Exit Gauge Head	62.14 m
Reynolds No.	520953.27	Friction Factor	0.01358 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	48	From node to node	46 - 44
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	10 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	4886.45 l/min	Velocity	2.81 m/s
Friction Loss	0.29 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	0.29 m	Total Pressure Drop	3.05 kPa
Entry Total Head	435.29 m	Exit Total Head	435.01 m
Entry Gauge Head	63.79 m	Exit Gauge Head	63.51 m
Reynolds No.	520953.27	Friction Factor	0.01358 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	50	From node to node	23 - 49
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	272 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	7236.32 l/min	Velocity	4.17 m/s
Friction Loss	16.09 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	16.09 m	Total Pressure Drop	171.96 kPa
Entry Total Head	459.45 m	Exit Total Head	443.36 m
Entry Gauge Head	87.95 m	Exit Gauge Head	71.86 m
Reynolds No.	771477.41	Friction Factor	0.01283 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	54	From node to node	49 - 51
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	140 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	6014.84 l/min	Velocity	3.46 m/s
Friction Loss	5.87 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	5.87 m	Total Pressure Drop	62.75 kPa
Entry Total Head	443.36 m	Exit Total Head	437.49 m
Entry Gauge Head	71.86 m	Exit Gauge Head	65.99 m
Reynolds No.	641253.3	Friction Factor	0.01317 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	55	From node to node	51 - 52
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	50 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	2349.83 l/min	Velocity	1.35 m/s
Friction Loss	0.37 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	0.37 m	Total Pressure Drop	3.97 kPa
Entry Total Head	437.49 m	Exit Total Head	437.12 m
Entry Gauge Head	65.99 m	Exit Gauge Head	65.62 m
Reynolds No.	250519.87	Friction Factor	0.0153 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	56	From node to node	25 - 53
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	115 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	8971.7 l/min	Velocity	5.16 m/s
Friction Loss	10.16 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	10.16 m	Total Pressure Drop	108.62 kPa
Entry Total Head	455.1 m	Exit Total Head	444.94 m
Entry Gauge Head	83.6 m	Exit Gauge Head	73.44 m
Reynolds No.	956489.48	Friction Factor	0.01247 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	57	From node to node	53 - 52
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	90 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	8889.82 l/min	Velocity	5.12 m/s
Friction Loss	7.82 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	7.82 m	Total Pressure Drop	83.56 kPa
Entry Total Head	444.94 m	Exit Total Head	437.12 m
Entry Gauge Head	73.44 m	Exit Gauge Head	65.62 m
Reynolds No.	947760.36	Friction Factor	0.01249 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	58	From node to node	53 - 19
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	285 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	81.88 l/min	Velocity	0.05 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	0.06 kPa
Entry Total Head	444.94 m	Exit Total Head	444.93 m
Entry Gauge Head	73.44 m	Exit Gauge Head	73.43 m
Reynolds No.	8729.11	Friction Factor	0.03208 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	63	From node to node	52 - 59
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	5 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	3	Total Fittings kf	0
Flow Rate	11239.65 l/min	Velocity	5.81 m/s
Friction Loss	0.63 m	Fitting Losses	5.15 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	5.78 m	Total Pressure Drop	61.82 kPa
Entry Total Head	437.12 m	Exit Total Head	431.34 m
Entry Gauge Head	65.62 m	Exit Gauge Head	59.84 m
Reynolds No.	1135026.17	Friction Factor	0.01482 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	64	From node to node	59 - 60
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	33.42 l/min	Velocity	0.02 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 kPa
Entry Total Head	431.34 m	Exit Total Head	431.33 m
Entry Gauge Head	59.84 m	Exit Gauge Head	59.83 m
Reynolds No.	3375.29	Friction Factor	0.04219 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	65	From node to node	60 - 61
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	4 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	22.8 l/min	Velocity	0.01 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 kPa
Entry Total Head	431.33 m	Exit Total Head	431.33 m
Entry Gauge Head	59.83 m	Exit Gauge Head	59.83 m
Reynolds No.	2301.94	Friction Factor	0.04745 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	66	From node to node	59 - 62
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	4196.59 l/min	Velocity	2.17 m/s
Friction Loss	0.02 m	Fitting Losses	0.29 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.31 m	Total Pressure Drop	3.27 kPa
Entry Total Head	431.34 m	Exit Total Head	431.03 m
Entry Gauge Head	59.84 m	Exit Gauge Head	59.53 m
Reynolds No.	423788.78	Friction Factor	0.01586 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	67	From node to node	31 - 32
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	30.24 l/min	Velocity	0.02 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 kPa
Entry Total Head	437.66 m	Exit Total Head	437.66 m
Entry Gauge Head	66.16 m	Exit Gauge Head	66.16 m
Reynolds No.	3053.69	Friction Factor	0.04348 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	68	From node to node	32 - 33
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	32.95 l/min	Velocity	0.02 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 kPa
Entry Total Head	437.66 m	Exit Total Head	437.66 m
Entry Gauge Head	66.16 m	Exit Gauge Head	66.16 m
Reynolds No.	3327.3	Friction Factor	0.04238 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	69	From node to node	31 - 34
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	1 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	19.17 l/min	Velocity	0.01 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 kPa
Entry Total Head	437.66 m	Exit Total Head	437.66 m
Entry Gauge Head	66.16 m	Exit Gauge Head	66.16 m
Reynolds No.	2043.31	Friction Factor	0.03132 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	72	From node to node	51 - 47
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	12 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	3665.01 l/min	Velocity	2.11 m/s
Friction Loss	0.2 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	0.2 m	Total Pressure Drop	2.15 kPa
Entry Total Head	437.49 m	Exit Total Head	437.29 m
Entry Gauge Head	65.99 m	Exit Gauge Head	65.79 m
Reynolds No.	390733.43	Friction Factor	0.0142 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	73	From node to node	49 - 70
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	160 mm	Inside Diameter	123 mm
Outside Diameter	160 mm	Pipe Length	110 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1221.48 l/min	Velocity	1.71 m/s
Friction Loss	2.15 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	2.15 m	Total Pressure Drop	22.96 kPa
Entry Total Head	443.36 m	Exit Total Head	441.21 m
Entry Gauge Head	71.86 m	Exit Gauge Head	69.71 m
Reynolds No.	203276.65	Friction Factor	0.01604 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	74	From node to node	70 - 71
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	160 mm	Inside Diameter	123 mm
Outside Diameter	160 mm	Pipe Length	103 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1221.48 l/min	Velocity	1.71 m/s
Friction Loss	2.01 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	2.01 m	Total Pressure Drop	21.5 kPa
Entry Total Head	441.21 m	Exit Total Head	439.2 m
Entry Gauge Head	69.71 m	Exit Gauge Head	67.7 m
Reynolds No.	203276.65	Friction Factor	0.01604 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	75	From node to node	71 - 47
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	160 mm	Inside Diameter	123 mm
Outside Diameter	160 mm	Pipe Length	98 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	1221.48 l/min	Velocity	1.71 m/s
Friction Loss	1.91 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	1.91 m	Total Pressure Drop	20.45 kPa
Entry Total Head	439.2 m	Exit Total Head	437.29 m
Entry Gauge Head	67.7 m	Exit Gauge Head	65.79 m
Reynolds No.	203276.65	Friction Factor	0.01604 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	77	From node to node	47 - 76
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	10 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	4886.49 l/min	Velocity	2.81 m/s
Friction Loss	0.29 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	0.29 m	Total Pressure Drop	3.05 kPa
Entry Total Head	437.29 m	Exit Total Head	437 m
Entry Gauge Head	65.79 m	Exit Gauge Head	65.5 m
Reynolds No.	520957.53	Friction Factor	0.01358 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	78	From node to node	76 - 46
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	250 mm	Inside Diameter	192 mm
Outside Diameter	250 mm	Pipe Length	60 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	4886.47 l/min	Velocity	2.81 m/s
Friction Loss	1.71 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	1.71 m	Total Pressure Drop	18.3 kPa
Entry Total Head	437 m	Exit Total Head	435.29 m
Entry Gauge Head	65.5 m	Exit Gauge Head	63.79 m
Reynolds No.	520955.4	Friction Factor	0.01358 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	87	From node to node	76 - 79
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	4 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	23.55 l/min	Velocity	0.01 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 kPa
Entry Total Head	437 m	Exit Total Head	437 m
Entry Gauge Head	65.5 m	Exit Gauge Head	65.5 m
Reynolds No.	2378.68	Friction Factor	0.04696 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	88	From node to node	79 - 82
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	21.65 l/min	Velocity	0.01 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 kPa
Entry Total Head	437 m	Exit Total Head	437 m
Entry Gauge Head	65.5 m	Exit Gauge Head	65.5 m
Reynolds No.	2186.66	Friction Factor	0.04823 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	89	From node to node	82 - 83
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	25.31 l/min	Velocity	0.01 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 kPa
Entry Total Head	437 m	Exit Total Head	437 m
Entry Gauge Head	65.5 m	Exit Gauge Head	65.5 m
Reynolds No.	2555.54	Friction Factor	0.04592 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	90	From node to node	79 - 84
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	25.11 l/min	Velocity	0.01 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 kPa
Entry Total Head	437 m	Exit Total Head	437 m
Entry Gauge Head	65.5 m	Exit Gauge Head	65.5 m
Reynolds No.	2535.76	Friction Factor	0.04604 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	91	From node to node	46 - 80
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	527.19 l/min	Velocity	0.27 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 kPa
Entry Total Head	435.29 m	Exit Total Head	435.29 m
Entry Gauge Head	63.79 m	Exit Gauge Head	63.79 m
Reynolds No.	53237.95	Friction Factor	0.0214 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	92	From node to node	80 - 81
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	28.12 l/min	Velocity	0.01 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 kPa
Entry Total Head	435.29 m	Exit Total Head	435.29 m
Entry Gauge Head	63.79 m	Exit Gauge Head	63.79 m
Reynolds No.	2839.23	Friction Factor	0.04446 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	93	From node to node	81 - 86
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	21.28 l/min	Velocity	0.01 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 kPa
Entry Total Head	435.29 m	Exit Total Head	435.29 m
Entry Gauge Head	63.79 m	Exit Gauge Head	63.79 m
Reynolds No.	2148.57	Friction Factor	0.0485 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	94	From node to node	80 - 85
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	24.55 l/min	Velocity	0.01 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 kPa
Entry Total Head	435.29 m	Exit Total Head	435.29 m
Entry Gauge Head	63.79 m	Exit Gauge Head	63.79 m
Reynolds No.	2478.88	Friction Factor	0.04636 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	97	From node to node	95 - 96
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	4162.09 l/min	Velocity	2.15 m/s
Friction Loss	0.02 m	Fitting Losses	0.28 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.3 m	Total Pressure Drop	3.22 kPa
Entry Total Head	430.36 m	Exit Total Head	430.05 m
Entry Gauge Head	58.86 m	Exit Gauge Head	58.55 m
Reynolds No.	420305.42	Friction Factor	0.01587 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	100	From node to node	59 - 99
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	7043.05 l/min	Velocity	3.64 m/s
Friction Loss	0.05 m	Fitting Losses	0.67 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.73 m	Total Pressure Drop	7.75 kPa
Entry Total Head	431.34 m	Exit Total Head	430.61 m
Entry Gauge Head	59.84 m	Exit Gauge Head	59.11 m
Reynolds No.	711236.38	Friction Factor	0.01522 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	101	From node to node	99 - 95
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	4162.09 l/min	Velocity	2.15 m/s
Friction Loss	0.02 m	Fitting Losses	0.24 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.25 m	Total Pressure Drop	2.72 kPa
Entry Total Head	430.61 m	Exit Total Head	430.36 m
Entry Gauge Head	59.11 m	Exit Gauge Head	58.86 m
Reynolds No.	420305.42	Friction Factor	0.01587 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	102	From node to node	99 - 98
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1.2	Total Fittings kf	0
Flow Rate	2880.96 l/min	Velocity	1.49 m/s
Friction Loss	0.01 m	Fitting Losses	0.14 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.14 m	Total Pressure Drop	1.55 kPa
Entry Total Head	430.61 m	Exit Total Head	430.46 m
Entry Gauge Head	59.11 m	Exit Gauge Head	58.96 m
Reynolds No.	290930.96	Friction Factor	0.01647 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	111	From node to node	41 - 103
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	11434.73 l/min	Velocity	5.91 m/s
Friction Loss	0.13 m	Fitting Losses	1.78 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.91 m	Total Pressure Drop	20.4 kPa
Entry Total Head	433.64 m	Exit Total Head	431.73 m
Entry Gauge Head	62.14 m	Exit Gauge Head	60.23 m
Reynolds No.	1154726.06	Friction Factor	0.01481 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	112	From node to node	103 - 106
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	2585.52 l/min	Velocity	1.34 m/s
Friction Loss	0.01 m	Fitting Losses	0.09 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.1 m	Total Pressure Drop	1.05 kPa
Entry Total Head	431.73 m	Exit Total Head	431.63 m
Entry Gauge Head	60.23 m	Exit Gauge Head	60.13 m
Reynolds No.	261096.46	Friction Factor	0.01668 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	113	From node to node	106 - 107
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	2585.52 l/min	Velocity	1.34 m/s
Friction Loss	0.01 m	Fitting Losses	0.09 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.1 m	Total Pressure Drop	1.05 kPa
Entry Total Head	431.63 m	Exit Total Head	431.53 m
Entry Gauge Head	60.13 m	Exit Gauge Head	60.03 m
Reynolds No.	261096.46	Friction Factor	0.01668 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	114	From node to node	103 - 108
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	2587.63 l/min	Velocity	1.34 m/s
Friction Loss	0.01 m	Fitting Losses	0.09 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.1 m	Total Pressure Drop	1.05 kPa
Entry Total Head	431.73 m	Exit Total Head	431.63 m
Entry Gauge Head	60.23 m	Exit Gauge Head	60.13 m
Reynolds No.	261310.06	Friction Factor	0.01668 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	115	From node to node	103 - 104
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	6261.57 l/min	Velocity	3.23 m/s
Friction Loss	0.04 m	Fitting Losses	0.53 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.57 m	Total Pressure Drop	6.13 kPa
Entry Total Head	431.73 m	Exit Total Head	431.15 m
Entry Gauge Head	60.23 m	Exit Gauge Head	59.65 m
Reynolds No.	632319.54	Friction Factor	0.01535 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	116	From node to node	104 - 109
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	2582.54 l/min	Velocity	1.33 m/s
Friction Loss	0.01 m	Fitting Losses	0.09 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.1 m	Total Pressure Drop	1.05 kPa
Entry Total Head	431.15 m	Exit Total Head	431.06 m
Entry Gauge Head	59.65 m	Exit Gauge Head	59.56 m
Reynolds No.	260795.86	Friction Factor	0.01668 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	117	From node to node	104 - 105
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	3679.03 l/min	Velocity	1.9 m/s
Friction Loss	0.01 m	Fitting Losses	0.18 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.2 m	Total Pressure Drop	2.12 kPa
Entry Total Head	431.15 m	Exit Total Head	430.96 m
Entry Gauge Head	59.65 m	Exit Gauge Head	59.46 m
Reynolds No.	371523.67	Friction Factor	0.01606 (Darcy f)

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	118	From node to node	105 - 110
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Steel B36.10	Pipe Class	Sch 040
Nominal Diameter	200 mm	Inside Diameter	202.7 mm
Outside Diameter	219.1 mm	Pipe Length	1 m
Pipe Roughness	0.045 mm	Allowable Press.	1 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	3679.03 l/min	Velocity	1.9 m/s
Friction Loss	0.01 m	Fitting Losses	0.18 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.2 m	Total Pressure Drop	2.12 kPa
Entry Total Head	430.96 m	Exit Total Head	430.76 m
Entry Gauge Head	59.46 m	Exit Gauge Head	59.26 m
Reynolds No.	371523.67	Friction Factor	0.01606 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	120	From node to node	15 - 119
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	26 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	2679.79 l/min	Velocity	0.76 m/s
Friction Loss	0.04 m	Fitting Losses	0.03 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	0.8 kPa
Entry Total Head	463.76 m	Exit Total Head	463.69 m
Entry Gauge Head	92.19 m	Exit Gauge Head	92.11 m
Reynolds No.	200929.85	Friction Factor	0.01583 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	121	From node to node	119 - 16
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	174 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	10321.43 l/min	Velocity	2.94 m/s
Friction Loss	3.55 m	Fitting Losses	0.44 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	3.99 m	Total Pressure Drop	42.65 kPa
Entry Total Head	463.76 m	Exit Total Head	459.77 m
Entry Gauge Head	92.26 m	Exit Gauge Head	88.27 m
Reynolds No.	773899.11	Friction Factor	0.01264 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	122	From node to node	4 - 119
Description		Equipment No	
Liquid	WATER	Viscosity	1.13 cp
Temperature	20 C	Density	1090 kg/m3
Vapour Pressure	1.6 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	35 m
Pipe Roughness	0.007 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	13001.22 l/min	Velocity	3.7 m/s
Friction Loss	1.1 m	Fitting Losses	1.4 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	2.49 m	Total Pressure Drop	26.66 kPa
Entry Total Head	466.26 m	Exit Total Head	463.76 m
Entry Gauge Head	94.76 m	Exit Gauge Head	92.26 m
Reynolds No.	974828.96	Friction Factor	0.01224 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	125	From node to node	124 - 1
Description		Equipment No	
Liquid	Process Water	Viscosity	1.13 cp
Temperature	30 C	Density	1009 kg/m3
Vapour Pressure	4.2 kPa		
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN20
Nominal Diameter	355 mm	Inside Diameter	273 mm
Outside Diameter	355 mm	Pipe Length	3 m
Pipe Roughness	0.003 mm	Allowable Press.	2000 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	15421.4 l/min	Velocity	4.39 m/s
Friction Loss	0.13 m	Fitting Losses	1.97 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	2.09 m	Total Pressure Drop	20.71 kPa
Entry Total Head	371 m	Exit Total Head	368.91 m
Entry Gauge Head	0 m	Exit Gauge Head	-2.59 m
Reynolds No.	1070367.3	Friction Factor	0.01177 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Pipe No	126	From node to node	123 - 0
Description		Equipment No	
Liquid	Process Water	Viscosity	1.13 cp
Temperature	30 C	Density	1009 kg/m3
Vapour Pressure	4.2 kPa		
Pipe Description	Polyethylene PE80 AS4130	Pipe Class	PN6.3
Nominal Diameter	200 mm	Inside Diameter	180 mm
Outside Diameter	200 mm	Pipe Length	5 m
Pipe Roughness	0.03 mm	Allowable Press.	630 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	4	Total Fittings kf	0
Flow Rate	7253.03 l/min	Velocity	4.75 m/s
Friction Loss	0.47 m	Fitting Losses	4.6 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	5.07 m	Total Pressure Drop	50.16 kPa
Entry Total Head	372 m	Exit Total Head	366.93 m
Entry Gauge Head	0 m	Exit Gauge Head	-4.57 m
Reynolds No.	763516.89	Friction Factor	0.01458 (Darcy f)

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	0	Node Type	Pump
Description	Diesel Fire Pump 1	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	471.93 m		
Pump Head	105 m	Pump Flow Rate	7253.03 l/min
Pump / Fan Efficiency	80 %	Pump Absorbed Power	156.99 kW
Casing Pressure	993.75 kPa		
Pump NPSH required	2.5 m	Pump NPSH available	5.22 m

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	1	Node Type	Pump
Description	Electric Fire Pump	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	473.91 m		
Pump Head	105 m	Pump Flow Rate	15421.4 l/min
Pump / Fan Efficiency	80 %	Pump Absorbed Power	333.8 kW
Casing Pressure	1013.3 kPa		
Pump NPSH required	0 m	Pump NPSH available	7.19 m

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	2	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	98.97 m	Int.(Gauge) Pressure	1057.87 kPa
Total Node Head	470.47 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	3	Node Type	Junction
Description	49	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	98.65 m	Int.(Gauge) Pressure	1054.54 kPa
Total Node Head	470.15 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	4	Node Type	Junction
Description	4	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	94.76 m	Int.(Gauge) Pressure	1012.87 kPa
Total Node Head	466.26 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	5	Node Type	Junction
Description	47	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	99.56 m	Int.(Gauge) Pressure	1064.2 kPa
Total Node Head	471.06 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	6	Node Type	Junction
Description	3	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	98.64 m	Int.(Gauge) Pressure	1054.36 kPa
Total Node Head	470.14 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	13	Node Type	Junction
Description	5	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	93.93 m	Int.(Gauge) Pressure	1004.04 kPa
Total Node Head	465.43 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	15	Node Type	Junction
Description	6	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	92.19 m	Int.(Gauge) Pressure	985.42 kPa
Total Node Head	463.69 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	16	Node Type	Junction
Description	7	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	88.27 m	Int.(Gauge) Pressure	943.57 kPa
Total Node Head	459.77 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	17	Node Type	Junction
Description	8	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	84.89 m	Int.(Gauge) Pressure	907.39 kPa
Total Node Head	456.39 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	18	Node Type	Junction
Description	9	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	78.95 m	Int.(Gauge) Pressure	843.89 kPa
Total Node Head	450.45 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	19	Node Type	Junction
Description	10	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	73.43 m	Int.(Gauge) Pressure	784.92 kPa
Total Node Head	444.93 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	23	Node Type	Junction
Description	25	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	87.95 m	Int.(Gauge) Pressure	940.1 kPa
Total Node Head	459.45 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	25	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	83.6 m	Int.(Gauge) Pressure	893.6 kPa
Total Node Head	455.1 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	29	Node Type	Junction
Description	11	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	69.85 m	Int.(Gauge) Pressure	746.6 kPa
Total Node Head	441.35 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	30	Node Type	Junction
Description	12	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	66.16 m	Int.(Gauge) Pressure	707.23 kPa
Total Node Head	437.66 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	31	Node Type	Junction
Description	34	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	66.16 m	Int.(Gauge) Pressure	707.23 kPa
Total Node Head	437.66 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	32	Node Type	Junction
Description	36	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	66.16 m	Int.(Gauge) Pressure	707.23 kPa
Total Node Head	437.66 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	33	Node Type	Nozzle
Description	35 - Zone E / V7	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	66.16 m	Int.(Gauge) Pressure	707.23 kPa
Total Node Head	437.66 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	34	Node Type	Nozzle
Description	13 - Zone F	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	66.16 m	Int.(Gauge) Pressure	707.23 kPa
Total Node Head	437.66 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	38	Node Type	Junction
Description	14	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	64.4 m	Int.(Gauge) Pressure	688.34 kPa
Total Node Head	435.9 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	40	Node Type	Junction
Description	15	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	62.73 m	Int.(Gauge) Pressure	670.49 kPa
Total Node Head	434.23 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	41	Node Type	Junction
Description	17	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	62.14 m	Int.(Gauge) Pressure	664.19 kPa
Total Node Head	433.64 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	44	Node Type	Junction
Description	18	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	63.51 m	Int.(Gauge) Pressure	678.83 kPa
Total Node Head	435.01 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	46	Node Type	Junction
Description	19	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	63.79 m	Int.(Gauge) Pressure	681.88 kPa
Total Node Head	435.29 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	47	Node Type	Junction
Description	23	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.79 m	Int.(Gauge) Pressure	703.23 kPa
Total Node Head	437.29 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	49	Node Type	Junction
Description	26	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	71.86 m	Int.(Gauge) Pressure	768.14 kPa
Total Node Head	443.36 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	51	Node Type	Junction
Description	27	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.99 m	Int.(Gauge) Pressure	705.39 kPa
Total Node Head	437.49 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	52	Node Type	Junction
Description	32	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.62 m	Int.(Gauge) Pressure	701.41 kPa
Total Node Head	437.12 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	53	Node Type	Junction
Description	30	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	73.44 m	Int.(Gauge) Pressure	784.98 kPa
Total Node Head	444.94 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	59	Node Type	Junction
Description	38	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	59.84 m	Int.(Gauge) Pressure	639.59 kPa
Total Node Head	431.34 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	60	Node Type	Junction
Description	39	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	59.83 m	Int.(Gauge) Pressure	639.59 kPa
Total Node Head	431.33 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	61	Node Type	Nozzle
Description	37 - Zone V9	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	59.83 m	Int.(Gauge) Pressure	639.59 kPa
Total Node Head	431.33 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	62	Node Type	Nozzle
Description	31 - Zone V8	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-115.4	Ext Flow (+In/-Out)	-4196.59 l/min
Int.(Gauge) Head	59.53 m	Int.(Gauge) Pressure	636.32 kPa
Total Node Head	431.03 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	70	Node Type	Junction
Description	29	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	69.71 m	Int.(Gauge) Pressure	745.18 kPa
Total Node Head	441.21 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	71	Node Type	Junction
Description	28	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	67.7 m	Int.(Gauge) Pressure	723.69 kPa
Total Node Head	439.2 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	76	Node Type	Junction
Description	21	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.5 m	Int.(Gauge) Pressure	700.18 kPa
Total Node Head	437 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	79	Node Type	Junction
Description	43	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.5 m	Int.(Gauge) Pressure	700.18 kPa
Total Node Head	437 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	80	Node Type	Junction
Description	40	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	63.79 m	Int.(Gauge) Pressure	681.88 kPa
Total Node Head	435.29 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	81	Node Type	Junction
Description	41	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	63.79 m	Int.(Gauge) Pressure	681.88 kPa
Total Node Head	435.29 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	82	Node Type	Junction
Description	44	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	65.5 m	Int.(Gauge) Pressure	700.18 kPa
Total Node Head	437 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	83	Node Type	Nozzle
Description	45	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	65.5 m	Int.(Gauge) Pressure	700.18 kPa
Total Node Head	437 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	84	Node Type	Nozzle
Description	22	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	65.5 m	Int.(Gauge) Pressure	700.18 kPa
Total Node Head	437 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	85	Node Type	Nozzle
Description	20	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	63.79 m	Int.(Gauge) Pressure	681.88 kPa
Total Node Head	435.29 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	86	Node Type	Nozzle
Description	42	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-0.01 l/min
Int.(Gauge) Head	63.79 m	Int.(Gauge) Pressure	681.88 kPa
Total Node Head	435.29 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	95	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	58.86 m	Int.(Gauge) Pressure	629.12 kPa
Total Node Head	430.36 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	96	Node Type	Nozzle
Description	New Settlers	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-115.4	Ext Flow (+In/-Out)	-4162.09 l/min
Int.(Gauge) Head	58.55 m	Int.(Gauge) Pressure	625.9 kPa
Total Node Head	430.05 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	98	Node Type	Nozzle
Description	Zone V7	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-79.6	Ext Flow (+In/-Out)	-2880.96 l/min
Int.(Gauge) Head	58.96 m	Int.(Gauge) Pressure	630.29 kPa
Total Node Head	430.46 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	99	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	59.11 m	Int.(Gauge) Pressure	631.84 kPa
Total Node Head	430.61 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	103	Node Type	Junction
Description	Foam Tank	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	60.23 m	Int.(Gauge) Pressure	643.79 kPa
Total Node Head	431.73 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	104	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	59.65 m	Int.(Gauge) Pressure	637.66 kPa
Total Node Head	431.15 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	105	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	59.46 m	Int.(Gauge) Pressure	635.53 kPa
Total Node Head	430.96 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	106	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	60.13 m	Int.(Gauge) Pressure	642.74 kPa
Total Node Head	431.63 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	107	Node Type	Nozzle
Description	FM 1	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-70.8	Ext Flow (+In/-Out)	-2585.52 l/min
Int.(Gauge) Head	60.03 m	Int.(Gauge) Pressure	641.69 kPa
Total Node Head	431.53 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	108	Node Type	Nozzle
Description	FM 2	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-70.8	Ext Flow (+In/-Out)	-2587.63 l/min
Int.(Gauge) Head	60.13 m	Int.(Gauge) Pressure	642.74 kPa
Total Node Head	431.63 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	109	Node Type	Nozzle
Description	Foam V11	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-71	Ext Flow (+In/-Out)	-2582.54 l/min
Int.(Gauge) Head	59.56 m	Int.(Gauge) Pressure	636.61 kPa
Total Node Head	431.06 m		

Helix Technologies Pty Ltd

Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	110	Node Type	Nozzle
Description	Foam V12	Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-101.4	Ext Flow (+In/-Out)	-3679.03 l/min
Int.(Gauge) Head	59.26 m	Int.(Gauge) Pressure	633.41 kPa
Total Node Head	430.76 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	119	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	371.5 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/min
Int.(Gauge) Head	92.26 m	Int.(Gauge) Pressure	986.22 kPa
Total Node Head	463.76 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		
Node No	123	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	372 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	372 m		

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Project	Nickel Project	Client	ABC Mining
Project No.	18478	Design Date	02/12/2016
Category	Demo Large Network	Atmos. Press	101.03 kPa
Description	A - Fire Water Distribution System		

Node No	124	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	371 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	371 m		