Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Network Type	Liquid	Calc. Method	Darcy
Description	Pumping Bingham Slurries (Weir ES5.1)		

Weir / Warman Slurry Pumping Manual, 2002 - pg S5-2 Example ES5.1
Ground Limestone and Clay Bingham Slurry 65% w/w flowing in 100m of 150mm and 200mm diameter pipes. Slurry Mixture Density Sm 1680kg/m3 with T0 = 19.44Pa and n=0.0383-s

Calculated Results Table 5.2 tests with 0.150m pipe

	Weir Manual					Helix deltaQ				
Point	Q(l/s)	V (m/s)	Hm	8V/D	Tw(Pa)	Q(l/s)	V (m/s)	Hm	8V/D	Tw(Pa)
1	12	0.67	3.37	35.5	20.8	12	0.68	3.37	36.217	20.827
2	19	1.06	3.50	56.4	21.60	19	1.08	3.50	57.343	21.636
3	33	1.86	3.76	99.2	23.24	33	1.87	3.80	99.594	23.254
4	42	2.38	5.85	126.8	33.20	42	2.38	6.42	126.756	24.295
Critical Velocity Vc			1.87m/s					1.86m/s		

Calculated Results Table 5.3 tests with 0.200m pipe

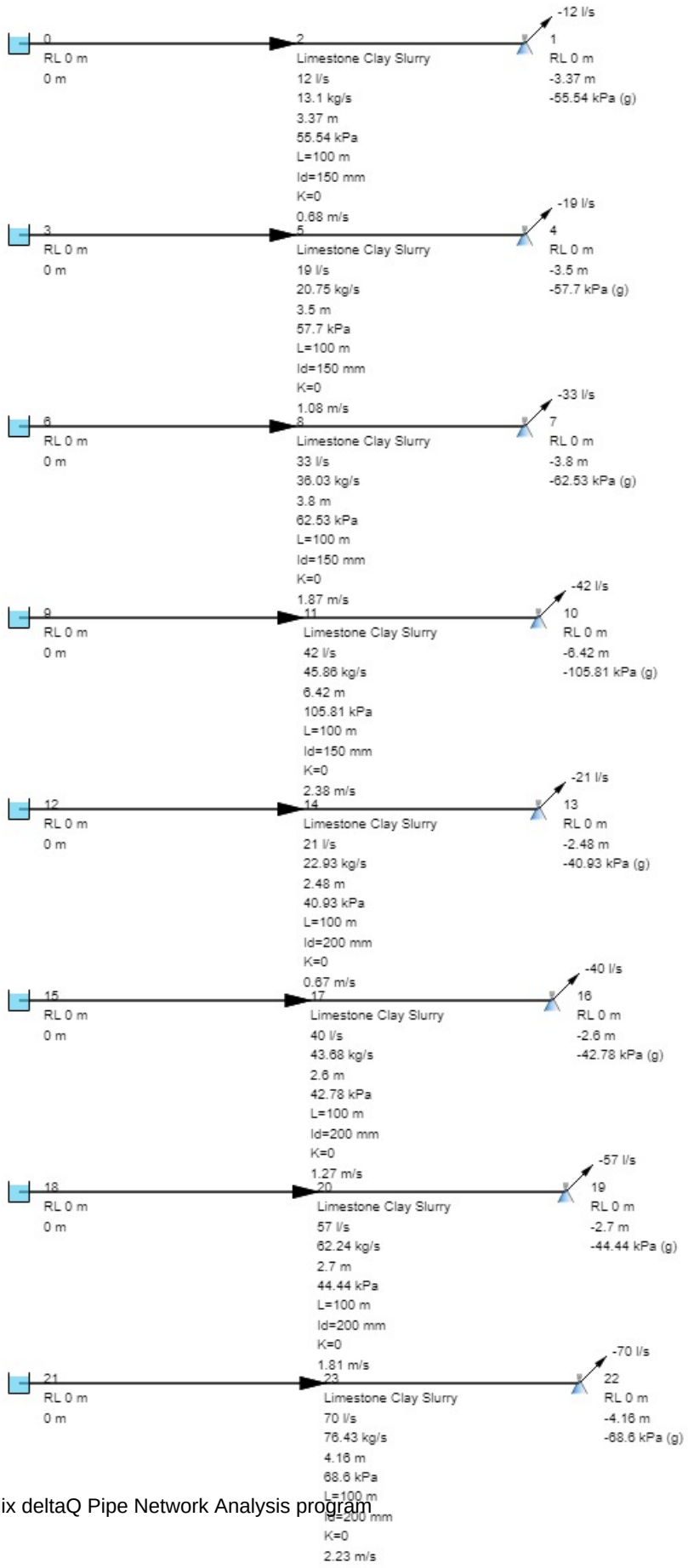
	Weir Manual					Helix deltaQ				
Point	Q(l/s)	V (m/s)	Hm	8V/D	Tw(Pa)	Q(l/s)	V (m/s)	Hm	8V/D	Tw(Pa)
1	21	0.68	2.49	26.2	20.48	21	0.67	2.48	26.738	20.464
2	40	1.28	2.60	51.2	21.40	40	1.27	2.60	50.930	21.391
3	57	1.82	2.70	72.8	22.23	57	1.81	2.70	72.575	22.220
4	70	2.23	3.86	89.10	31.80	70	2.23	4.16	89.125	22.853
Critical Velocity Vc			1.81m/s					1.82m/s		

The results compare very well, although there is slight difference in the turbulent flow Head loss Hm. The Helix method has been set to use Hf = KQ^2 as detailed in the Warman manual, therefore the Warman results have probably been adjusted in some way.

Click on the Graph tab in the right hand side window above and then click on the pipes in turn to view the System graph with the duty point marked on it for each pipe. You can see the transition to turbulent zone around the critical velocity flow rate.

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		



Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	2	From node to node	0 - 1
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	13.1 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	20.827 Pa	Shear Rate 8V/D	36.217 -s
Hedstrom No.	500908	Pressure Drop / m	555.39 Pa/m
Critical Velocity Vc	1.86 m/s	Critical Flow Rate	32.86 l/s
Reynolds No at Vc	11979.79		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	150 mm	Inside Diameter	150 mm
Outside Diameter	168.3 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	12 l/s	Velocity	0.68 m/s
Friction Loss	3.37 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	3.37 m	Total Pressure Drop	55.54 kPa
Entry Total Head	0 m	Exit Total Head	-3.37 m
Entry Gauge Head	0 m	Exit Gauge Head	-3.37 m
Reynolds No.	4467.64	Friction Factor	0.21509 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	5	From node to node	3 - 4
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	20.75 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	21.636 Pa	Shear Rate 8V/D	57.343 -s
Hedstrom No.	500908	Pressure Drop / m	576.97 Pa/m
Critical Velocity Vc	1.86 m/s	Critical Flow Rate	32.86 l/s
Reynolds No at Vc	11979.79		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	150 mm	Inside Diameter	150 mm
Outside Diameter	168.3 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	19 l/s	Velocity	1.08 m/s
Friction Loss	3.5 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	3.5 m	Total Pressure Drop	57.7 kPa
Entry Total Head	0 m	Exit Total Head	-3.5 m
Entry Gauge Head	0 m	Exit Gauge Head	-3.5 m
Reynolds No.	7073.76	Friction Factor	0.08913 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	8	From node to node	6 - 7
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	36.03 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	23.254 Pa	Shear Rate 8V/D	99.594 -s
Hedstrom No.	500908	Pressure Drop / m	625.26 Pa/m
Critical Velocity Vc	1.86 m/s	Critical Flow Rate	32.86 l/s
Reynolds No at Vc	11979.79		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	150 mm	Inside Diameter	150 mm
Outside Diameter	168.3 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	33 l/s	Velocity	1.87 m/s
Friction Loss	3.8 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	3.8 m	Total Pressure Drop	62.53 kPa
Entry Total Head	0 m	Exit Total Head	-3.8 m
Entry Gauge Head	0 m	Exit Gauge Head	-3.8 m
Reynolds No.	12285.81	Friction Factor	0.03202 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	11	From node to node	9 - 10
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	45.86 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	24.295 Pa	Shear Rate 8V/D	126.756 -s
Hedstrom No.	500908	Pressure Drop / m	1058.11 Pa/m
Critical Velocity Vc	1.86 m/s	Critical Flow Rate	32.86 l/s
Reynolds No at Vc	11979.79		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	150 mm	Inside Diameter	150 mm
Outside Diameter	168.3 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	42 l/s	Velocity	2.38 m/s
Friction Loss	6.42 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	6.42 m	Total Pressure Drop	105.81 kPa
Entry Total Head	0 m	Exit Total Head	-6.42 m
Entry Gauge Head	0 m	Exit Gauge Head	-6.42 m
Reynolds No.	15636.42	Friction Factor	0.03345 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	14	From node to node	12 - 13
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	22.93 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	20.464 Pa	Shear Rate 8V/D	26.738 -s
Hedstrom No.	890503	Pressure Drop / m	409.28 Pa/m
Critical Velocity Vc	1.82 m/s	Critical Flow Rate	57.14 l/s
Reynolds No at Vc	14671.22		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	214 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	21 l/s	Velocity	0.67 m/s
Friction Loss	2.48 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	2.48 m	Total Pressure Drop	40.93 kPa
Entry Total Head	0 m	Exit Total Head	-2.48 m
Entry Gauge Head	0 m	Exit Gauge Head	-2.48 m
Reynolds No.	5863.78	Friction Factor	0.21811 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	17	From node to node	15 - 16
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	43.68 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	21.391 Pa	Shear Rate 8V/D	50.930 -s
Hedstrom No.	890503	Pressure Drop / m	427.81 Pa/m
Critical Velocity Vc	1.82 m/s	Critical Flow Rate	57.14 l/s
Reynolds No at Vc	14671.22		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	214 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	40 l/s	Velocity	1.27 m/s
Friction Loss	2.6 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	2.6 m	Total Pressure Drop	42.78 kPa
Entry Total Head	0 m	Exit Total Head	-2.6 m
Entry Gauge Head	0 m	Exit Gauge Head	-2.6 m
Reynolds No.	11169.08	Friction Factor	0.06284 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	20	From node to node	18 - 19
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	62.24 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	22.220 Pa	Shear Rate 8V/D	72.575 -s
Hedstrom No.	890503	Pressure Drop / m	444.39 Pa/m
Critical Velocity Vc	1.82 m/s	Critical Flow Rate	57.14 l/s
Reynolds No at Vc	14671.22		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	214 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	57 l/s	Velocity	1.81 m/s
Friction Loss	2.7 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	2.7 m	Total Pressure Drop	44.44 kPa
Entry Total Head	0 m	Exit Total Head	-2.7 m
Entry Gauge Head	0 m	Exit Gauge Head	-2.7 m
Reynolds No.	15915.93	Friction Factor	0.03214 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Pipe No	23	From node to node	21 - 22
Description		Equipment No	
Slurry Type	Bingham Plastic		
Slurry Description	Limestone Clay Slurry		
Slurry Reference	Weir ES5.1		
SG Carrier Liquid Sl	1	Liquid Viscosity	1 cP
SG of Dry Solids	2.65	SG of Mixture	1.68
Conc. by Mass Cw	65 % w/w	Concentration by Vol	41.2 % v/v
Solids Flow Rate	76.43 kg/s	Particle Size d50	0.02 mm
Yield Stress To	19.44 Pa	Co-eff of Rigidity n	0.0383 Pa-s
Yield Stress Tw 8V/D	22.853 Pa	Shear Rate 8V/D	89.125 -s
Hedstrom No.	890503	Pressure Drop / m	686.03 Pa/m
Critical Velocity Vc	1.82 m/s	Critical Flow Rate	57.14 l/s
Reynolds No at Vc	14671.22		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.98
Pipe Description	Steel Pipes 6" AS1836 (ANSI B36.10)	Pipe Class	Sch 40
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	214 mm	Pipe Length	100 m
Pipe Roughness	0.03 mm	Allowable Press.	8130 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	70 l/s	Velocity	2.23 m/s
Friction Loss	4.16 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	4.16 m	Total Pressure Drop	68.6 kPa
Entry Total Head	0 m	Exit Total Head	-4.16 m
Entry Gauge Head	0 m	Exit Gauge Head	-4.16 m
Reynolds No.	19545.55	Friction Factor	0.0329 (Darcy f)

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

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

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	1	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-12 l/s
Int.(Gauge) Head	-3.37 m	Int.(Gauge) Pressure	-55.54 kPa
Total Node Head	-3.37 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	3	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	4	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-19 l/s
Int.(Gauge) Head	-3.5 m	Int.(Gauge) Pressure	-57.7 kPa
Total Node Head	-3.5 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	6	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	7	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-33 l/s
Int.(Gauge) Head	-3.8 m	Int.(Gauge) Pressure	-62.53 kPa
Total Node Head	-3.8 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	9	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	10	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-42 l/s
Int.(Gauge) Head	-6.42 m	Int.(Gauge) Pressure	-105.81 kPa
Total Node Head	-6.42 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	12	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	13	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-21 l/s
Int.(Gauge) Head	-2.48 m	Int.(Gauge) Pressure	-40.93 kPa
Total Node Head	-2.48 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	15	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	16	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-40 l/s
Int.(Gauge) Head	-2.6 m	Int.(Gauge) Pressure	-42.78 kPa
Total Node Head	-2.6 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	18	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	19	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-57 l/s
Int.(Gauge) Head	-2.7 m	Int.(Gauge) Pressure	-44.44 kPa
Total Node Head	-2.7 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	21	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	0 m		

Helix Technologies Pty Ltd

Project	Weir Slurry Pumping Manual	Client	Helix Demo
Project No.	4567	Design Date	12/02/2021
Category	Demo Bingham Slurry	Atmos. Press	100.19 kPa
Description	Pumping Bingham Slurries (Weir ES5.1)		

Node No	22	Node Type	Nozzle
Description		Equipment No	
Rel. Level (RL)	0 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-70 l/s
Int.(Gauge) Head	-4.16 m	Int.(Gauge) Pressure	-68.6 kPa
Total Node Head	-4.16 m		