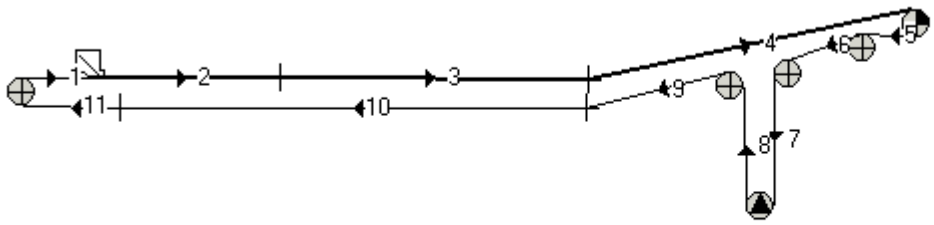
Conveyor Design Summary

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Design Summary Report



Conveyed Material					
Material Description	***LIMESTONE, CRUSHED***				
Low Bulk Density	***1,360***	kg/m3	High Bulk Density	***1,450***	kg/m3
Angle of Repose	***38***	deg	Surcharge Angle	***25***	deg
Material Lumpsize	***10***	mm	Uniform / Mixed Material	***Mixed Material***	
Conveyer Data					
Conveying Distance	**69.44**	m	Design Capacity	***777***	tonnes/h
Nett Lift / Lower (-)	**11.2**	m	Belt Speed	***3***	m/s
Belt Details					
Belt Width Selected	**750**	mm	Belt Percentage Full	**80**	%
Belt Class / Plies	**315/2**		Top Cover Thickness	**6**	mm
Belt Rated Tension	**31.5**	kN/m	Bottom Cover Thickness	**2**	mm
Belt Plies	**2**		Belt Mass	**9.41**	kg/m
Belt Tensions and Power Calculations ISO					
Effective Tension-Fully Loade(	**11.71**	kN	Belt Power - Empty Belt	**5.79**	kW
Maximum Tension Tmax	**22.07**	kN	Belt Power - Inclines Loaded	**35.13**	kW
Minimum Tension Tmin	**10.26**	kN	Belt Power - Declines Loaded	**8.16**	kW
Sag Tension **1.5 %**	**7.98**	kN	Belt Power - Fully Loaded	**35.13**	kW
Takeup Type	***Vertical Gravity***		Drive Efficiency (Ave)	**94**	%
Takeup Mass	***2,108***	kg	Absorbed Power (Fully Loaded)	**37.34**	kW
			Installed Power	**45**	kW
Carry and Return Idlers					
Carry Idler Trough Angle	***35***	deg	Return Idler Trough Angle	***10***	deg
Carry Idler Spacing	***1.2***	m	Return Idler Spacing	***3***	m
Carry Idler No Rolls x Dia	***3 x 152***	mm	Return Idler No Rolls x Dia	***2 x 127***	mm
Dynamics and Miscellaneous Data					
Start-up Factor - Fully Loaded	***140***	%	CEMA Temperature Factor Kt	***1***	
Start-up Factor - Empty	***140***	%	Total Braking Torque LSS	***1***	kNm
Starting Time - Fully Loaded	**3.77**	sec	Stopping Time - Loaded, Braking	**2.11**	sec
Starting Time - Empty	**1**	sec	Stopping Time - Loaded, Coasting	**2.8**	sec

Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

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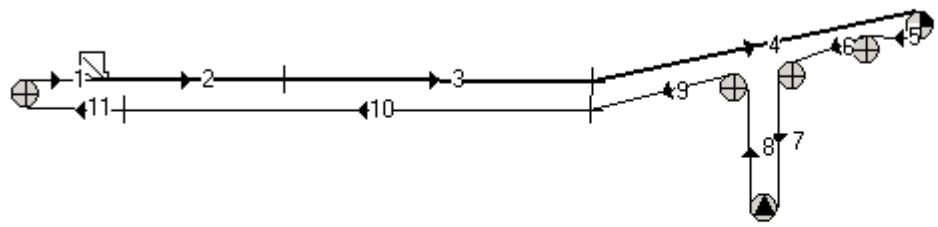
Conveyor Sections - Input Data



Station		Description	X co-ord m	Y co-ord m	Z co-ord m	Section Length m	Section Lift m	Section Capacity tonnes/hr	Idler Spacing m	Friction Factor Input	Skirt Length m	No. Scra-pers	Tension Adjust-ment kN
1	Tail	Tail	0	0	0.25	2.02	0.25	0	1	0.0000			
2	Hopper	Second	2	0	0.5	3	0	777	0.5	0.0000	3		
3	Int. Pt	Third	5	0	0.5	29.75	0.05	777	1.5	0.0000			
4	Int. Pt	Third	34.75	0	0.55	36.69	11.15	777	1.5	0.0000			
5	Drive		69.7	0	11.7	0.81	-0.4	0	3	0.0000		2	
6	Snub		69	0	11.3	10.35	-3.6	0	3	0.0000			
7	Bend		59.3	0	7.7	5.41	-5.4	0	3	0.0000			
8	Takeup		58.9	0	2.3	5.12	5.1	0	3	0.0000			
9	Bend		58.5	0	7.4	24.7	-7.6	0	3	0.0000			
10	Int. Pt		35	0	-0.2	34	0.2	0	3	0.0000			
11	Int. Pt	Dummy	1	0	0	1.03	0.25	0	1	0.0000		1	
Totals:						152.88	0						

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Conveyor Belt Details

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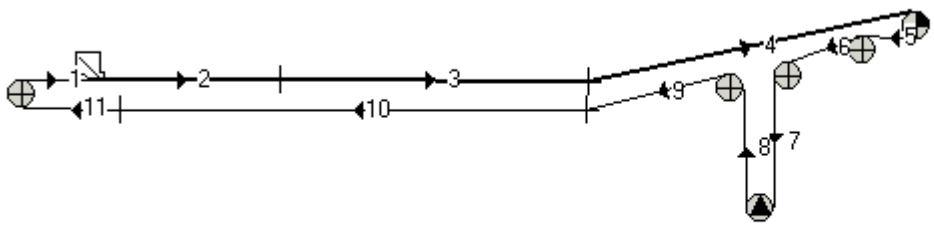
Belt Details



Belt Make & Class		
Belt Category	**Goodyear Fabric**	
Belt Description	**GOODYEAR PLYLON-HI**	
Belt Class	**315/2**	
Belt Fibre	**FABRIC**	
Belt Rated Tension	***31.5***	kN/m
Number of Plies	**2**	
Belt Modulus	**2,070**	kN/m
Cable Diameter	**0**	mm
Cable Pitch	**0**	mm
Number of Cables	**0**	

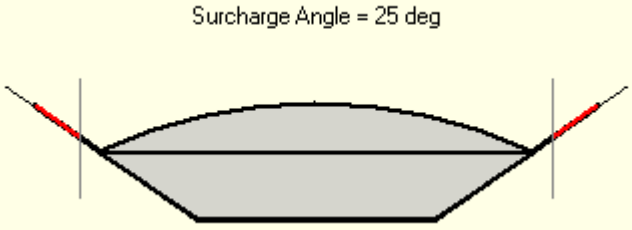
Belt Dimensions		
Belt Width	**750**	mm
Belt Top Cover Thickness	**6.00**	mm
Belt Carcass Thickness	**3.10**	mm
Belt Bottom Cover Thickness	**2.00**	mm
Belt Total Thickness	**11.10**	mm
Belt Total Length (L)	**155.87**	m
Time for 1 Belt Revolution	**46.29**	sec

Belt & Material Mass		
Belt Top Cover Mass	**5.08**	kg/m
Belt Carcass Mass	**2.63**	kg/m
Belt Bottom Cover Mass	**1.70**	kg/m
Belt Mass Wb (per unit length)	**9.41**	kg/m
Material Mass Wm	**71.94**	kg/m
Total Mass Wb + Wm	**81.35**	kg/m
Flooded Belt Material Mass	**142.27**	kg/m
Flooded Belt Capacity	**1,537**	tonnes/hr
Belt Total Mass (Wb x L)	**1,466**	kg

Input Data		
Belt Speed	***3***	m/s
Belt Design Capacity Input	***777***	tonnes/hr
Section Loading Max Capacity	***777***	tonnes/hr
Material Low Bulk Density	***1,360***	kg/m3
Material High Bulk Density	***1,450***	kg/m3
Material Lump Size	***10***	mm
Carry Idler Trough Angle	***35***	deg

Belt Tensions		
Belt Rated Operating Tension	***31.5***	kN/m
Actual Maximum Run Tension	**29.43**	kN/m
Actual Maximum Start Tension	**37.65**	kN/m
Allowable Belt Tension, Starting	**150**	%
Actual Belt Tension, Starting	**119.53**	%

Belt Load Area & Capacity		
Belt Load Area Available	**0.0664**	m2
Flooded Belt Load Area	**0.0981**	m2
Belt Min. Rec. Edge Distance	**64.3**	mm
Belt Actual Edge Distance	**93.0**	mm
Burden Depth	**135**	mm
Allowable Percentage Full	**80.00**	%
Belt Actual Percentage Full	**80.00**	%
Max Capacity @ 100% Full	**975**	tonnes/hr



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Tension Summary

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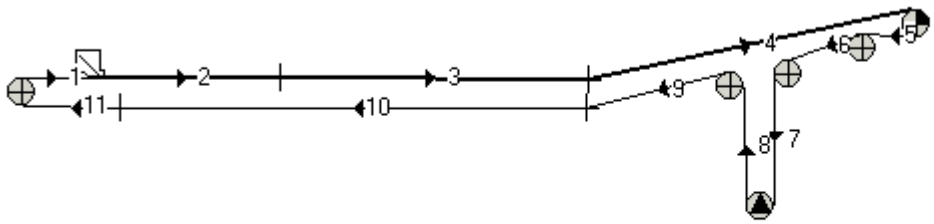
Conveyor Tension Summary Report



Drive Torque Start-up Factor Loaded	*140* %	Takeup Mass	2108 kg
Drive Torque Start-up Factor Empty	*140* %	*1.5* % Sag Tension	7.98 kN
		5% Sag Tension	2.39 kN

Point No		Running				Starting		Braking		Coasting	
		Fully Loaded Tension	Empty Tension	Inclines Loaded Tension	Declines Loaded Tension	Fully Loaded Tension	Empty Tension	Fully Loaded Tension	Empty Tension	Fully Loaded Tension	Empty Tension
		kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
1	Tail	10.72	10.72	10.72	10.72	11.58	13.97	9.18	9.67	9.56	10.37
	Sag %	0.11	0.11	0.11	0.11	0.10	0.08	0.13	0.12	0.12	0.11
2	Hopper	10.81	10.81	10.81	10.81	11.81	14.6	9.01	9.59	9.46	10.4
	Sag %	0.46	0.05	0.46	0.46	0.42	0.34	0.55	0.52	0.53	0.48
3	Int. Pt	11.8	11.1	11.8	11.8	13.07	14.99	9.52	9.49	10.08	10.38
	Sag %	1.27	0.16	1.27	1.27	1.14	1.00	1.57	1.58	1.48	1.44
4	Int. Pt	12.47	11.2	12.47	11.94	15.93	16.91	6.29	9.01	7.81	10.28
	Sag %	1.20	0.15	1.20	1.25	0.94	0.88	2.38	1.66	1.91	1.45
5	Drive	22.1	12.34	22.1	13.13	28.24	20.25	11.13	9.44	13.83	11.19
	Sag %	0.16	0.28	0.16	0.26	0.12	0.17	0.31	0.37	0.25	0.31
6	Snub	11.02	11.02	11.02	11.04	11.4	9.64	11.55	11.06	11.59	10.93
	Sag %	0.31	0.31	0.31	0.31	0.30	0.36	0.30	0.31	0.30	0.32
7	Bend	10.77	10.77	10.77	10.79	11.29	9.94	11.04	10.63	11.14	10.62
	Sag %	0.32	0.32	0.32	0.32	0.31	0.35	0.31	0.33	0.31	0.33
8	Takeup	10.34	10.34	10.34	10.34	10.34	10.34	10.34	10.34	10.34	10.34
	Sag %	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
9	Bend	10.87	10.87	10.87	10.87	11.02	11.44	10.59	10.68	10.66	10.8
	Sag %	0.32	0.32	0.32	0.32	0.31	0.30	0.33	0.32	0.32	0.32
10	Int. Pt	10.29	10.29	10.29	10.29	10.78	12.16	9.4	9.69	9.62	10.08
	Sag %	0.34	0.34	0.34	0.34	0.32	0.28	0.37	0.36	0.36	0.34
11	Int. Pt	10.39	10.39	10.39	10.39	11.22	13.52	8.9	9.38	9.27	10.05
	Sag %	0.11	0.11	0.11	0.11	0.10	0.09	0.13	0.12	0.12	0.11
Minimum T		10.29	10.29	10.29	10.29	10.34	9.64	6.29	9.01	7.81	10.05
Maximum T		22.1	12.34	22.1	13.13	28.24	20.25	11.55	11.06	13.83	11.19
Max Sag%		1.27	0.34	1.27	1.27	1.14	1.00	2.38	1.66	1.91	1.45
Effective T		11.71	1.93	11.71	2.72						
Ave.Belt Ten		12.45	10.96	12.45	11.28	14.33	14.33	9.2	9.68	Average Belt Tension Stationary =	
Belt Elong.(m)		0.204	0.054	0.204	0.087	0.393	0.393	-0.122	-0.074		
T/up Travel		0.102	0.027	0.102	0.043	0.196	0.196	-0.061	-0.037	10.42 kN	

Minimum Operating Tension : 6.29 kN

Takeup Mass Deficiency due to Belt Sag: 344 kg

Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match

Point No	Running				Starting		Braking		Coasting	
	Fully Loaded Tension kN	Empty Tension kN	Inclines Loaded Tension kN	Declines Loaded Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN	Fully Loaded Tension kN	Empty Tension kN

with the Shaft mounted gearbox.

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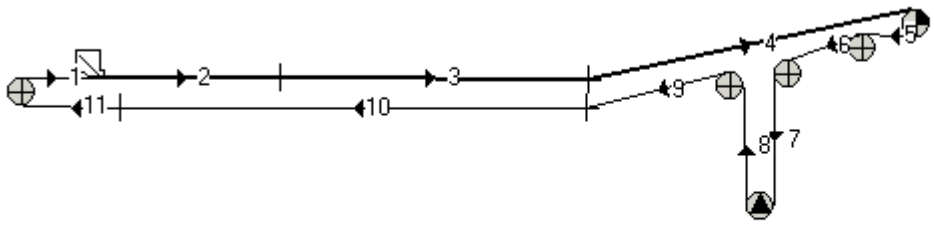
Takeup & Drive Traction Calculation



Drive Torque Start-up Factor Loaded	***140*** %	Takeup Mass	***2108*** kg
Drive Torque Start-up Factor Empty	***140*** %		

Drive No		*Running* Fully Loaded	*Running* Empty Belt	*Starting* Fully Loaded	*Starting* Empty Belt	*Braking* Fully Loaded	*Braking* Empty Belt
Drive Number: 1							
Wrap Angle	*deg*	**210**	**210**	**210**	**210**	**210**	**210**
Co-efficient of Friction		**0.35**	**0.35**	**0.45**	**0.45**	**0.45**	**0.45**
Drive Factor		**0.384**	**0.384**	**0.238**	**0.238**	**0.238**	**0.238**
Tight Side Tension, T1	*kN*	**22.1**	**12.34**	**28.24**	**20.25**	**11.01**	**10.52**
Slack Side Tension, T2	*kN*	**10.47**	**10.47**	**10.84**	**9.07**	**11.13**	**9.44**
Minimum Required T2	*kN*	**4.47**	**0.72**	**4.14**	**2.66**	**0.03**	**0.26**
Surplus T2 Tension	*kN*	**6.00**	**9.75**	**6.70**	**6.41**	**10.98**	**9.19**

Additional Takeup Mass Required **0** *kg*

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Conveyor Starting & Stopping

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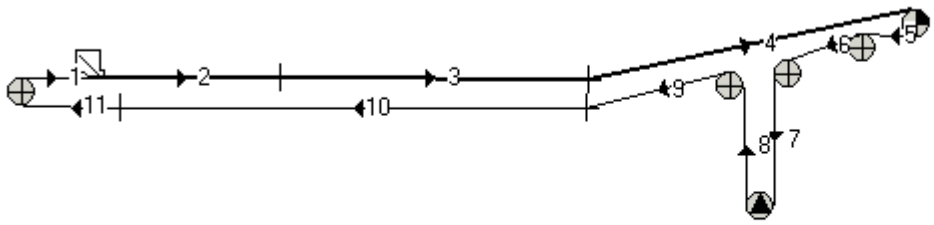
Conveyor Dynamics, Starting, Stopping Times



System Masses		
Mass of Belt	**1,466**	kg
Mass of Material	**4,996**	kg
Carry Idler Equivalent Mass	**872**	kg
Return Idler Equivalent Mass	**239**	kg
Pulley Equivalent Mass	**741**	kg
Drive Equivalent Mass	**2,651**	kg
Total System Equivalent Mass	**10,937**	kg

Tensions and Accelerating Forces		
Total Braking Force	**3.82**	kN
Effective Tension - Loaded	**11.71**	kN
Effective Tension - Empty	**1.93**	kN
Accelerating Tension - Loaded	**9.99**	kN
Accelerating Tension - Empty	**19.19**	kN

Starting Times & Acceleration Rates		
Starting Time - Fully Loaded	**3.77**	sec
Starting Time - Empty	**1**	sec
Acceleration Rate - Fully Loaded	**0.8**	m/s2
Acceleration Rate - Empty	**3**	m/s2

Belt Tension Rise Starting / Braking		
Max Belt Tension, Start/Brake	**28.24**	kN
Belt Width	**750**	mm
Maximum Belt Tension /width	**37.65**	kN/m
Belt Rated Tension /width	***31.5***	kN/m
Actual Max Tension, Start/Brake	**119.53**	%

Input Data		
Belt Speed	***3***	m/s
Belt Rated Tension	***31.5***	kN/m
Allowable Belt Start Tension Rise	**150**	%
Drive Inertia	***1***	kg-m2
Total Braking Torque	***1***	kNm
Start-up Factor - Fully Loaded	***140***	%
Start-up Factor - Empty	***140***	%
Installed Power	**45**	kW
Drive Efficiency (Ave)	**94**	%

Stopping Times & Deceleration Rates		
Stopping Time - Loaded, Braking	**2.11**	sec
Stopping Time - Loaded, Coasting	**2.8**	sec
Stopping Time - Empty, Braking	**3.11**	sec
Stopping Time - Empty, Coasting	**9.28**	sec
Deceleration - Loaded, Braking	**-1.42**	m/s2
Deceleration - Loaded, Coasting	**-1.07**	m/s2
Deceleration - Empty, Braking	**-0.96**	m/s2
Deceleration - Empty, Coasting	**-0.32**	m/s2

Stopping Distances & Discharge Volumes		
Stopping Distance - Loaded, Braking	**3.17**	m
Stopping Distance - Loaded, Coasting	**4.2**	m
Stopping Distance - Empty, Braking	**4.67**	m
Stopping Distance - Empty, Coasting	**13.92**	m
Discharge Mass, Braking	**228**	kg
Discharge Mass, Coasting	**302**	kg
Discharge Volume, Braking	**0.17**	m3
Discharge Volume, Coasting	**0.22**	m3

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Conveyor Drive Details

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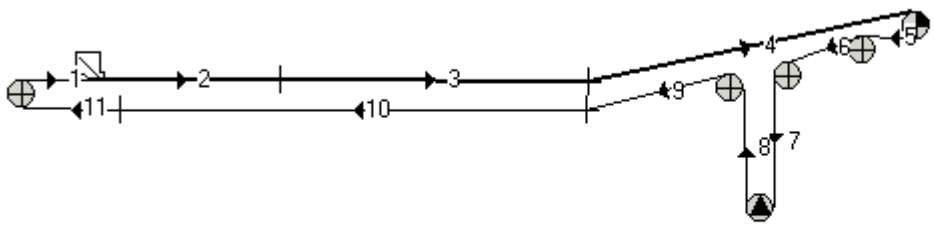
Conveyor Drive Details



Drive Number	**1**				
Drive Type	***Tripper***		Pulley Condition	***Dry***	
Load Share %	***100***	%	Belt Wrap Angle	***210***	deg
Number of Motors on Drive	***1***		Co-Eff of Friction - Running	***0.35***	
Starting Torque % Fully Loadec	***140***	%	Drive Factor Cw - Running	**0.384**	
Starting Torque % Empty Belt	***140***	%	Co-Eff of Friction - Starting	***0.45***	
Total Drive Inertia	***1***	kg-m2	Drive Factor Cw - Starting	**0.238**	
Drive Equivalent Mass	**2,651**	kg	Pulley Lagging Type	***Rubber***	
Tight Side Tension T1	**22.1**	kN	Pulley Lagging Thickness	***12***	mm
Slack Side Tension T2	**10.47**	kN	Pulley Input Power (Te x V)	**35.1**	kW
Effective Tension Te	**11.7**	kN	Drive Efficiency	***94***	%
Pulley Lagging Thickness	***12***	mm	Motor Selection Safety Factor	***1.1***	
Pulley Shell Diameter	**500**	mm	Motor Power Rating	**45**	kW
Pulley Outside Diameter	**524**	mm	Motor Voltage	***415***	Volts
Pulley Shaft Diameter	**120**	mm	Motor FL Speed	**1,475**	rpm
Pulley Bearing Diameter	**110**	mm	Pulley Speed	**109.34**	rpm
Backstop Required	**YES**		Reducer Ratio Required	**13.49**	
Backstop Torque (3 x FLT)	**11791**	Nm	Low Speed Brake Torque	***1***	kNm
Backstop Torque (for runback)	**1571**	Nm	High Speed Brake Torque	**79**	Nm

Designers Comments: *Figures in Italics are Design Input Values*

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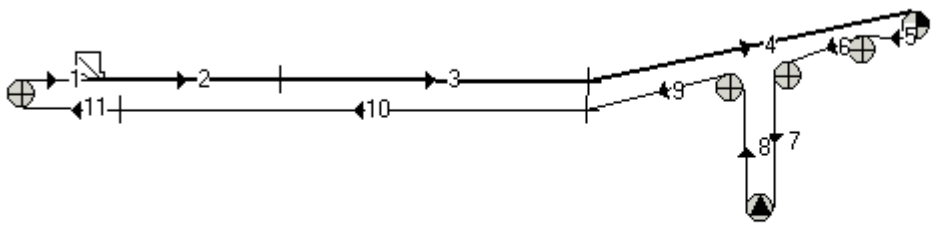
Conveyor Motor Details



Motor Details for Drive Number: 1 *Auto Selection*

Motor Category	***Metric Motor***		Total Motor Power on Drive	**45.00**	kW
Decription	***Electric Motor***		Absorbed Power at Pulley	**35.1**	kW
Number of Motors on Drive	***1***		Drive Efficiency	***94***	%
Motor Power Rating	**45**	kW	Absorbed Power at Motor	**37.34**	kW
Motor Voltage	***415***	Volts	Motor FL Speed	**1,475**	rpm
Number of poles	***4***		Motor FL Torque	**291**	Nm
Motor Frame Size	***F225M04***		Motor Full Load Current	***75.7***	Amps
Motor Shaft Diameter	***60***	mm	Motor Efficiency @ Duty Point	**92.43**	%
Motor Shaft Height	***225***	mm	Motor Power Factor @ Duty Pt	**0.87**	
Moment of Inertia	***0.775***	kg-m2	Mass of Motor	***400***	kg

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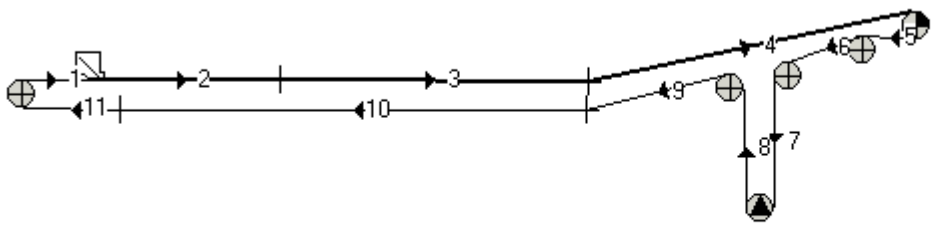
Conveyor No.	CV 01	Design Date	18/09/2004

Fluid Coupling Details



Fluid Coupling / Soft Starter Details for Drive Number: 1 *Auto Selection*

Coupling Category	***Voith***		Coupling Size	***422***	
Decription	***VOITH TSS***		Motor Power Rating	**45**	kW
Number of Motors on Drive	***1***		Motor FL Speed	**1,475**	rpm
Coupling Power Rating	**75**	kW	Coupling Rated Slip	**3**	%
Peak Torque %	**140**	%	Run-up Torques % (2 sec)	**75**	%
Min. Required Ramping Time	**0.29**	sec	Coupling Output Speed	**1431**	
Max Starting Time	**30**	sec	Mass of Coupling	**66**	kg

Designers Comments: *Figures in Italics are Design Input Values*

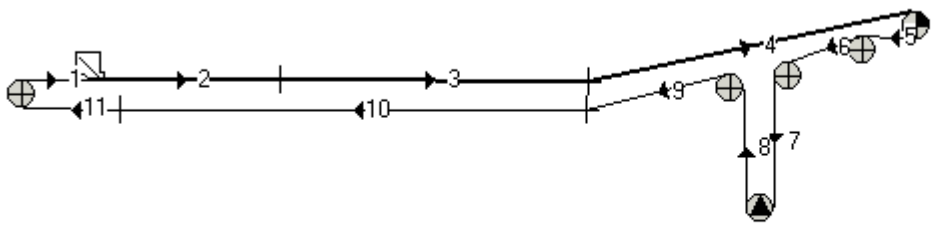
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Conveyor Gearbox Details

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Gearbox Details



Gearbox Details for Drive Number: 1 *Auto Selection*

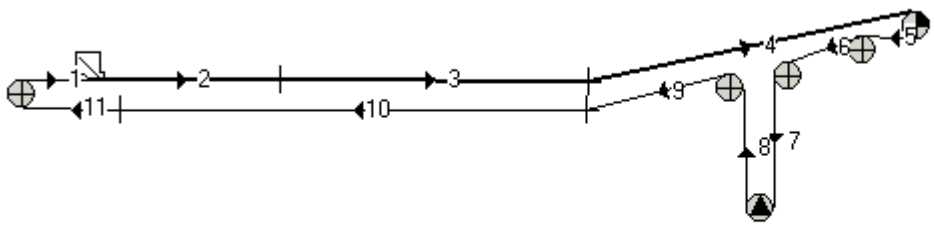
Gearbox Category	***Fenner Shaft Mounted***		Number of Motors on Drive	***1***	
Decription	***Fenner Shaft Mounted***		Motor Power Rating	**45**	kW
Type	***250x630-4 SPB***		Maximum LS Shaft Torque Rating	***5,940***	Nm
Size	***J5***		LS Shaft Torque @ Motor FL	**3,930**	Nm
Code	***5.047***		Motor FL Speed	**1,475**	rpm
Ratio	***12.718***		Plus Speed Selection Tolerance	***5***	%
Number of Stages	***1***		Minus Speed Selection Tolerance	***5***	%
Service Factor	***1.5***		Fluid Coupling Slip	***3***	%
Design Efficiency	***94***	%			
Actual Efficiency	***92***	%	Max Output Shaft speed	**117.94**	rpm
Maximum Input Shaft Speed	***1,500***	rpm	Min Output Shaft speed	**102.22**	rpm
Minimum Input Shaft Speed	***1,300***	rpm	Design Pulley Speed	***109.34***	rpm
Input Shaft Diameter	***55***	mm	Actual Pulley Speed	**112.50**	rpm
Output Shaft Diameter	***100***	mm		**Shaft Mount**	

Designers Comments: *Figures in Italics are Design Input Values*

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Brake Details



Brake Details for Drive Number: *Manual Selection*

Brake Category	***Svendborg BSFH 200***	
Description	***Svendborg - Simon Hydraulics***	
Number of Motors on Drive	***1***	
Caliper	**BSFH 202**	
Brake Location	***Low Speed Side***	
Low Speed Braking Torque @Pulley	***1***	kNm
High Speed Braking Torque @Pulley	**79**	Nm
Brake Selection Input Data		
Design Braking Torque Input	***800***	Nm
Selected Brake's Torque Rating	**461**	Nm
Design Stopping Time	***10***	sec
Consecutive No of Stops	***3***	sec
Average No of Stops	***3***	/ hr
Ambient Temperature	***30***	deg C
Disc Temperature after stops	***44***	deg C

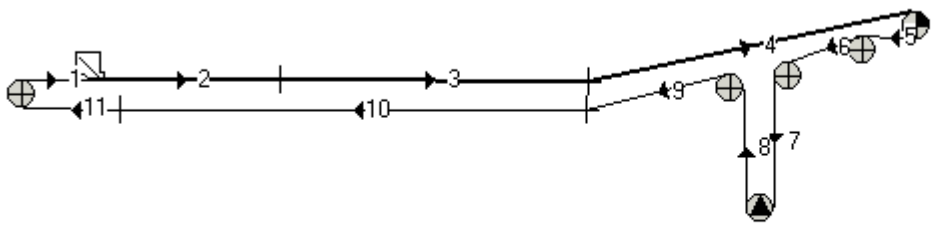
Disc Material	***Mild Steel***	
Disc Diameter	***700***	mm
Disc Thickness	***20***	mm
Co-eff of Friction (Pad-Disc)	***0.4***	*u*
Caliper Clamping Force	***2,000***	N
Pad offset Width W	***60***	mm
Maximum Air Gap	***3***	mm
Recommended working airgap is 1mm		
Disc Initial Speed	***1,450***	rpm
Disc Moment of Inertia	**3.701**	kg-m2
Gearbox Ratio Required	**13.49**	
Drive Efficiency	***94***	%
Mass of Caliper	**26**	kg
Brake Caliper Price	**$0**	

Designers Comments: *Figures in Italics are Design Input Values*

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Idlers



	Carry Side Idlers	Return Side Idlers
Idler Category	**Prok Carry**	**Prok Vee Return**
Idler Description	**Series 20 3 Roll Carry 152 Plain Inline**	**Vee Return Series 15 2 Roll 127 Dia**
Idler Design Belt Width	**750** mm	**750** mm
Idler Series	**20**	**15**
Drawing Number		
Nominal Idler Spacing	**1.2** m	**3** m
Total Number of Idlers	**53**	**26**
Idler Price	**$0.00**	**$0.00**
Troughing Angle	**35** deg	**10** deg
Idler Shaft Diameter	**27** mm	**27** mm
Idler Bearing Diameter	**25** mm	**25** mm
Number of Idler Rolls	**3**	**2**
Idler Roll Diameter	**152** mm	**127** mm
Idler Rotation Speed	**377** rpm	**451** rpm
Roll Face Width	**283** mm	**419** mm
Roll Bearing Centres	**226.8** mm	**367.2** mm
Shaft Support Centres	**307** mm	**447.4** mm
Idler Support Fixing Width	**1,000** mm	**1,000** mm
Idlerset Rotating Mass	**16.2** kg	**9.2** kg
Idlerset Total Mass	**31.7** kg	**24.2** kg
Idler Vertical Misalignment Allowance	**9** mm	**36** mm
Dynamic Load Factor	**1.13**	**1.4**
Belt Deviation Load	**600** N	**480** N
Total Load on Centre Roll	**1,442** N	**797** N
Type of Bearing	**Ball**	**Ball**
Bearing Designation	**6205**	**6205**
Bearing Dynamic Load Rating C	**14,000** N	**14,000** N
Bearing L10h Life	**323,526** hrs	**1,602,098** hrs
Allowable Shaft Deflection at Bearing	**8** min	**10** min
Actual Shaft Deflection at Bearing	**2.06** min	**1.84** min

Designers Comments:

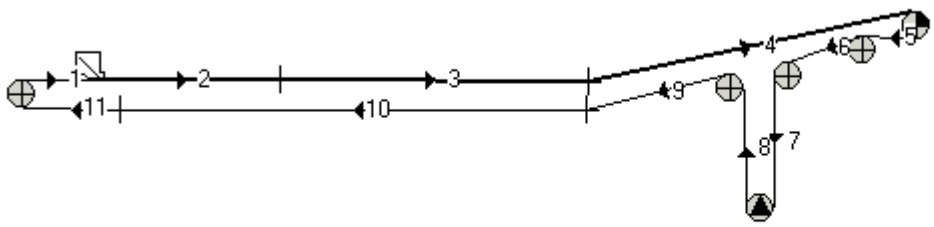
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced

if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Pulleys



Pulley Position	Pulley Desc	Shell Dia D mm	Lagging t mm	Face Width mm	Shaft Length mm	Shaft Dia S mm	Brg Crs mm	Brg Dia mm	Wrap Angle deg	Pulley Speed rpm	Pulley Mass kg	Mom of Inertia kg-m2	Braking Torque kNm	Braking Force kN
Tail		400	12	850	1,590	100	1,270	90	180	135	175	5.67		
Drive		500	12	850	1,640	120	1,270	110	210	109	257	12.35	1	3.82
Snub		273	12	850	1,490	60	1,270	60	20	193	78	1.29		
Bend		400	12	850	1,550	90	1,270	80	90	135	176	5.62		
Takeup		400	12	850	1,590	100	1,270	90	180	135	175	5.67		
Bend		400	12	850	1,550	90	1,270	80	90	135	176	5.62		

Designers Comments: Note: * indicates manual pulley dimension override was used

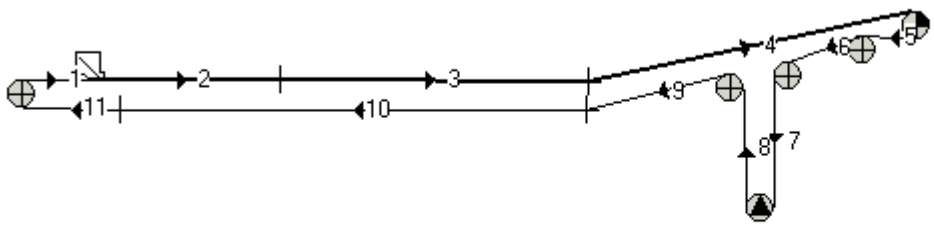
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Pulley Design Data

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Pulleys



Belt Speed 3 m/s — **Total Installed Power** 45 kW

Belt Width 750 mm

Pulley Position	Pulley Desc	Shell Dia D mm	Lagging t mm	Face Width mm	Brg Crs mm	Drive Extension mm	Drive Power kW	Pulley Speed rpm	Wrap Angle deg	T1 Start kN	T2 Start kN	T1 Run kN	T2 Run kN
Tail	Tail	400	12	850	1,270	0		135.1	180	13.97 Starting	14.41 Empty	10.72 Running	10.78 Full
Drive		500	12	850	1,270	0	45.00	109.3	210	28.24 Starting	10.84 Full	22.1 Running	10.47 Full
Snub		273	12	850	1,270	0		192.9	20	11.59 Coasting	11.59 Full	11.02 Running	11.08 Full
Bend		400	12	850	1,270	0		135.1	90	11.29 Starting	11.45 Full	10.77 Running	10.83 Full
Takeup		400	12	850	1,270	0		135.1	180	10.34 Starting	10.77 Empty	10.34 Running	10.39 Full
Bend		400	12	850	1,270	0		135.1	90	11.44 Starting	11.88 Empty	10.87 Running	10.93 Full

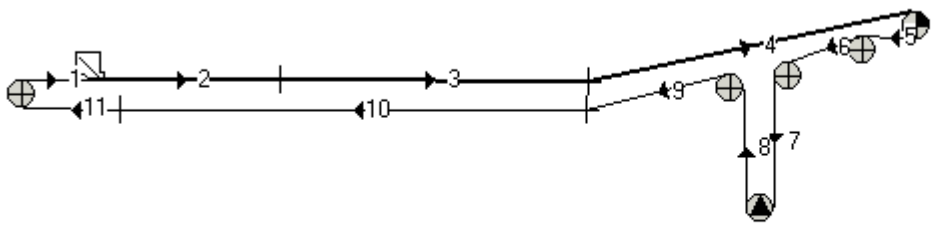
Designers Comments: Note: * indicates manual pulley dimension override was used

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

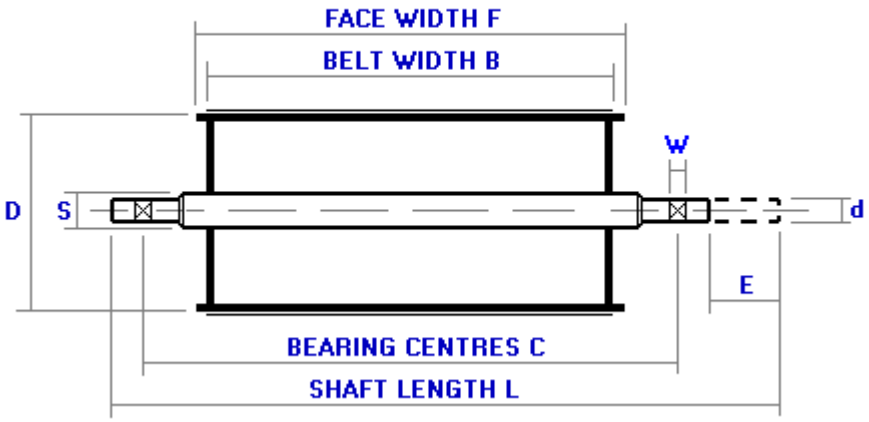
Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Pulleys



CONVEYOR PULLEYS



Pulley Type	Overall Dia mm	Shell Dia D mm	Face Width F mm	Belt Width B mm	Shaft Length L mm	Shaft Dia S mm	Bearing Crs C mm	Bearing Dia d mm	Shaft Ext E mm	Lagging t mm
Tail	424	400	850	750	1,590	100	1,270	90	0	12
Drive	524	500	850	750	1,640	120	1,270	110	0	12
Snub	297	273	850	750	1,490	60	1,270	60	0	12
Bend	424	400	850	750	1,550	90	1,270	80	0	12
Takeup	424	400	850	750	1,590	100	1,270	90	0	12
Bend	424	400	850	750	1,550	90	1,270	80	0	12

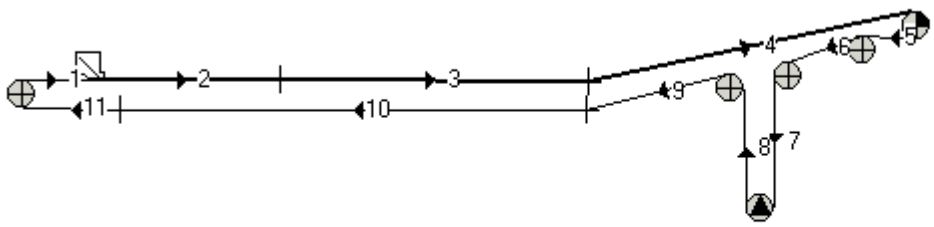
Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Pulley Shafts



Pulley Position	Shaft Desc	Shaft Length mm	Wrap Angle deg	T1 Run kN	T2 Run kN	Resultant Force kN	T1 Start kN	Calculated Defl. Dia mm	Calculated Dt. Dia mm	Selected Shaft Dia S mm	Selected Brg Dia mm	Brg Crs mm	Shaft Mass kg
Tail		1,590	180	10.72	10.78	21.44	11.58	91.4	88.5	100	90	1,270	98
Drive		1,640	210	22.1	10.47	31.56	28.24	100.7	106.7	120	110	1,270	146
Snub	Drive	1,490	20	11.02	11.08	3.83	11.4	59.4	49.8	60	60	1,270	33
Bend	BBK	1,550	90	10.77	10.83	15.25	11.29	83.9	79	90	80	1,270	77
Takeup		1,590	180	10.34	10.39	20.67	10.34	90.5	87.4	100	90	1,270	98
Bend	BBK	1,550	90	10.87	10.93	15.37	11.02	84.1	79.2	90	80	1,270	77

Allowable Shaft Deflection at Hub: ***5*** min Allowable Shaft Stress ***41*** N/mm2

Designers Comments: Note: * indicates manual pulley dimension override was used

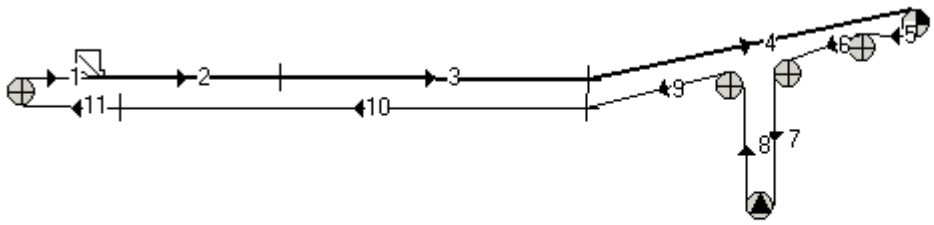
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Conveyor Belt Tensions

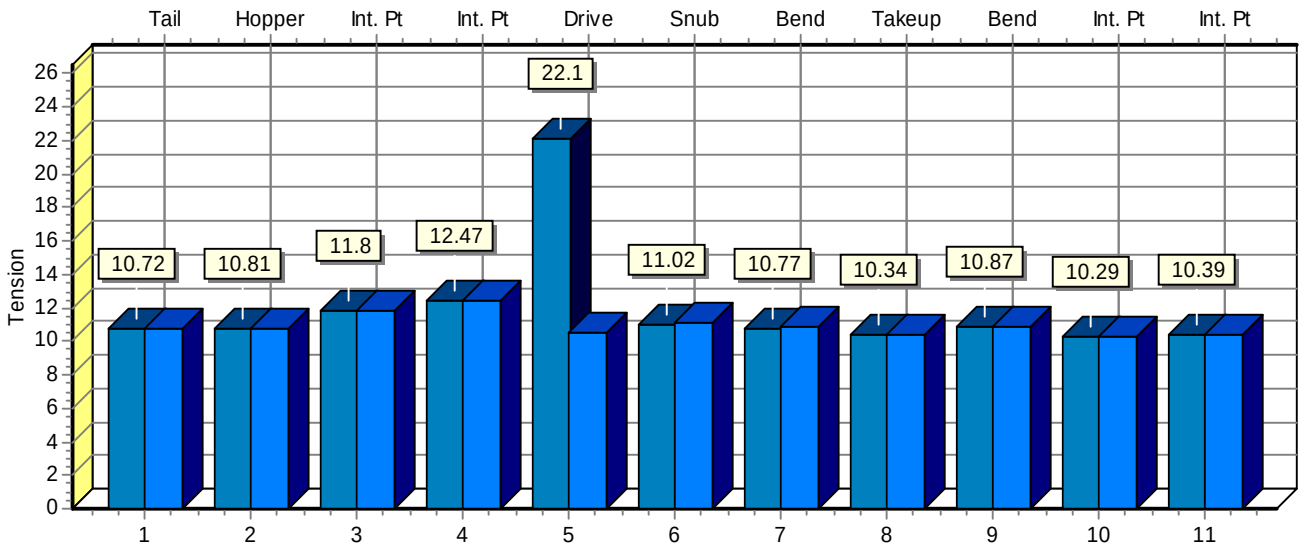
Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

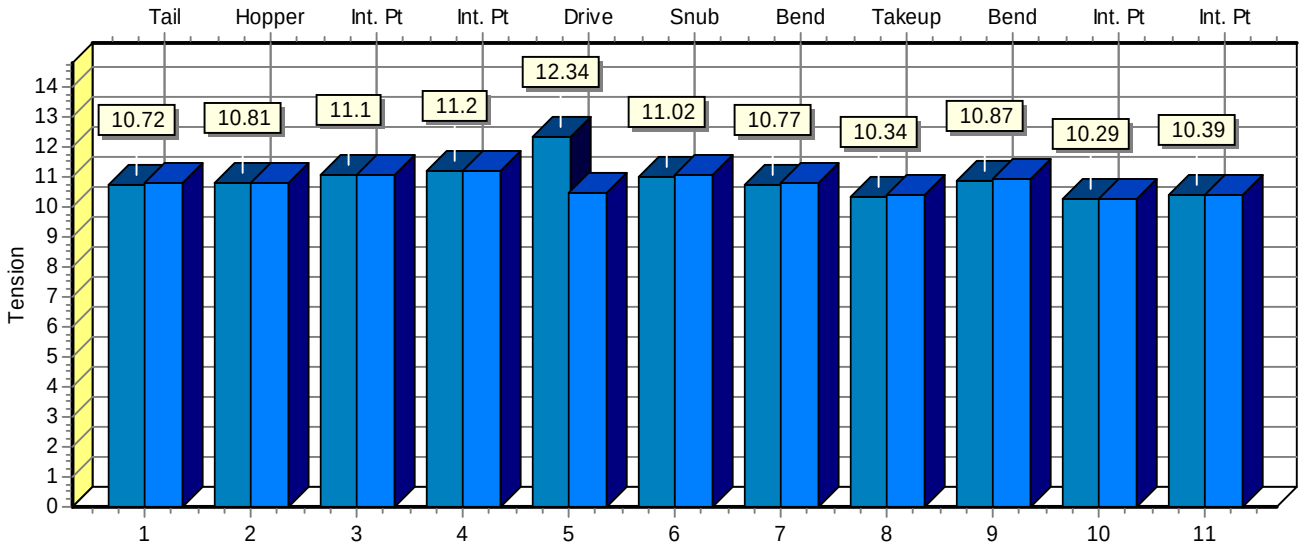
Conveyor Tension Graphs



Running Tensions - Fully Loaded

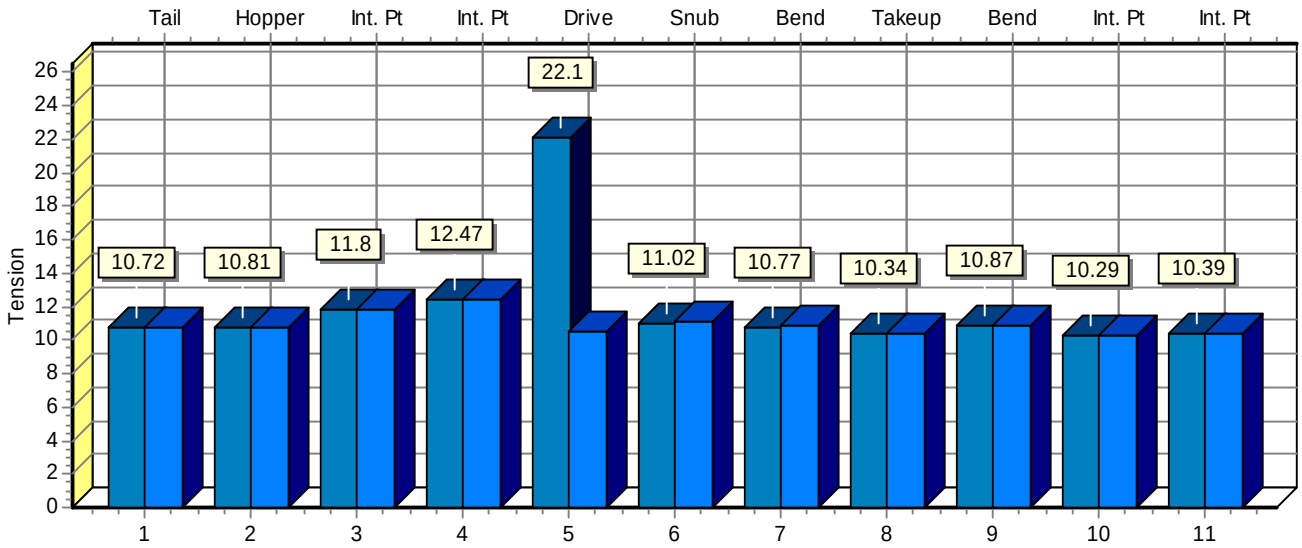


Running Tensions - Empty Belt

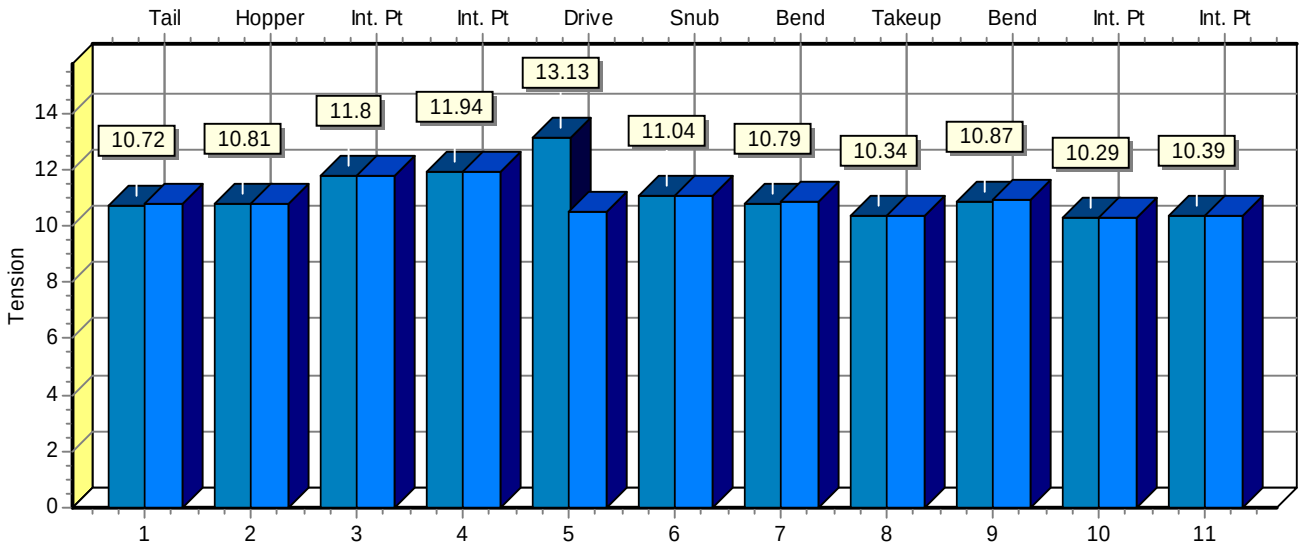


Conveyor Belt Tensions

Running Tensions - Inclines & Level Sections Loaded

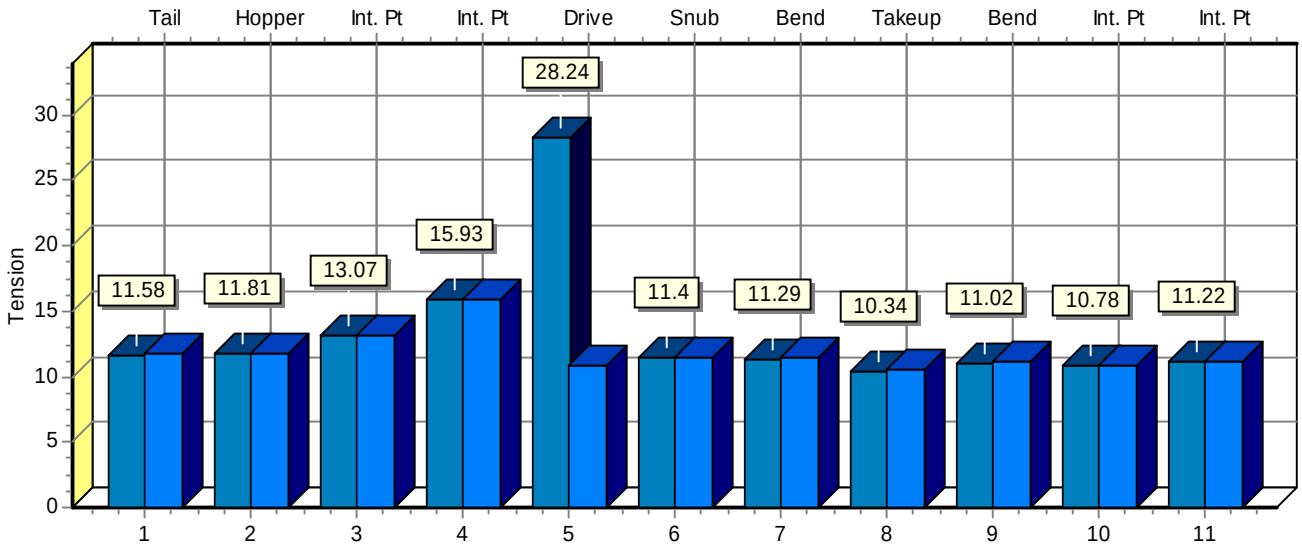


Running Tensions - Declines & Level Sections Loaded

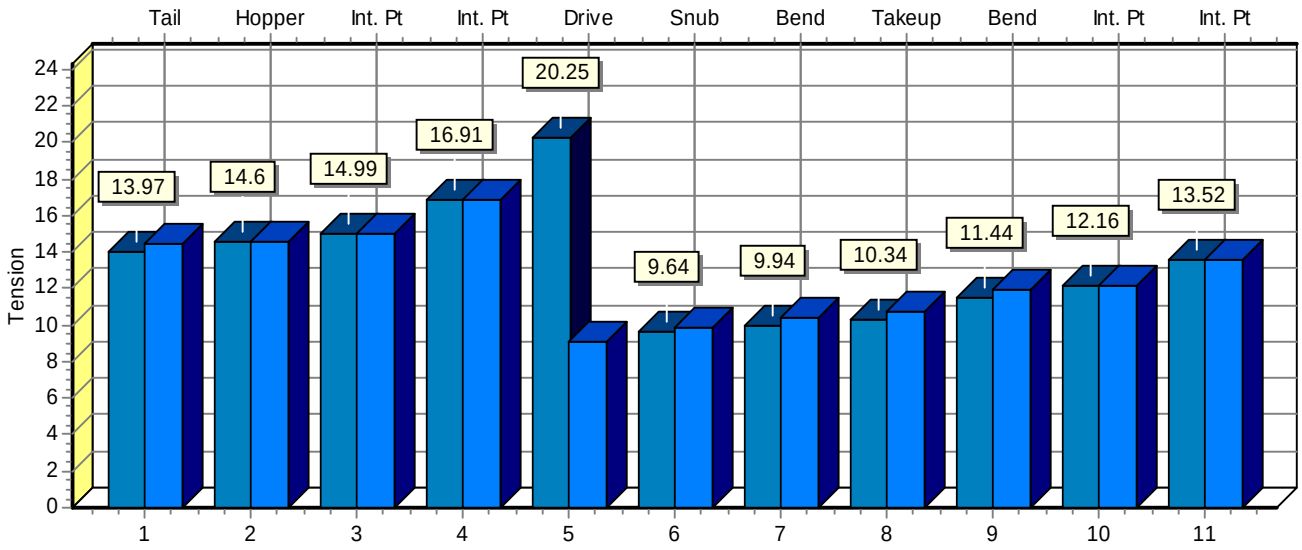


Conveyor Belt Tensions

Belt Tensions - Starting Fully Loaded

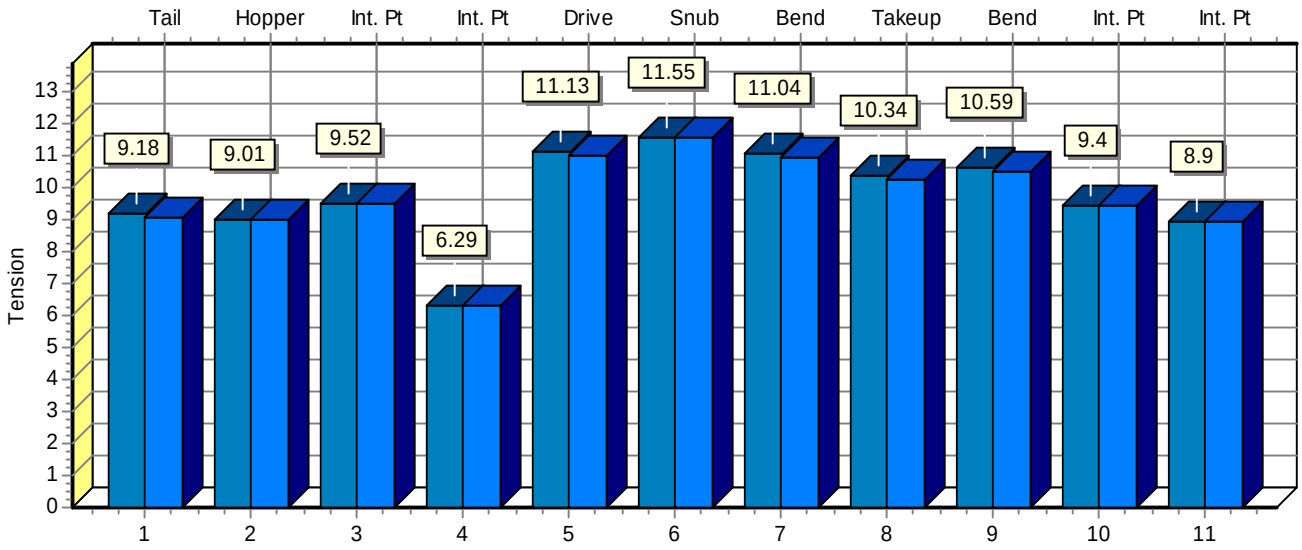


Belt Tensions - Starting Empty

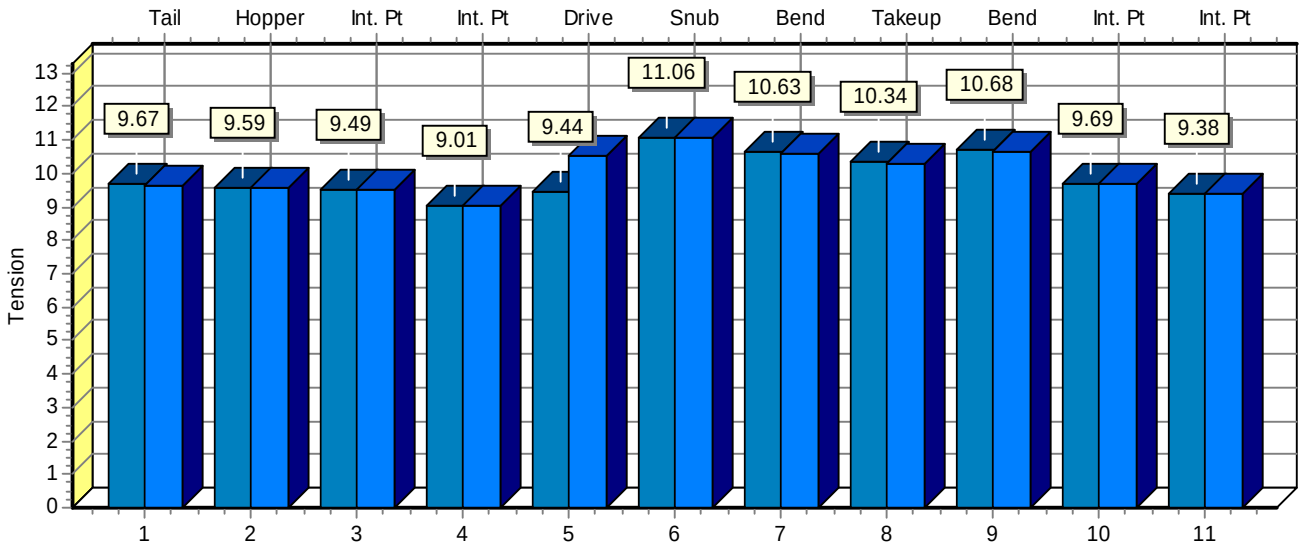


Conveyor Belt Tensions

Belt Tensions - Braking Fully Loaded

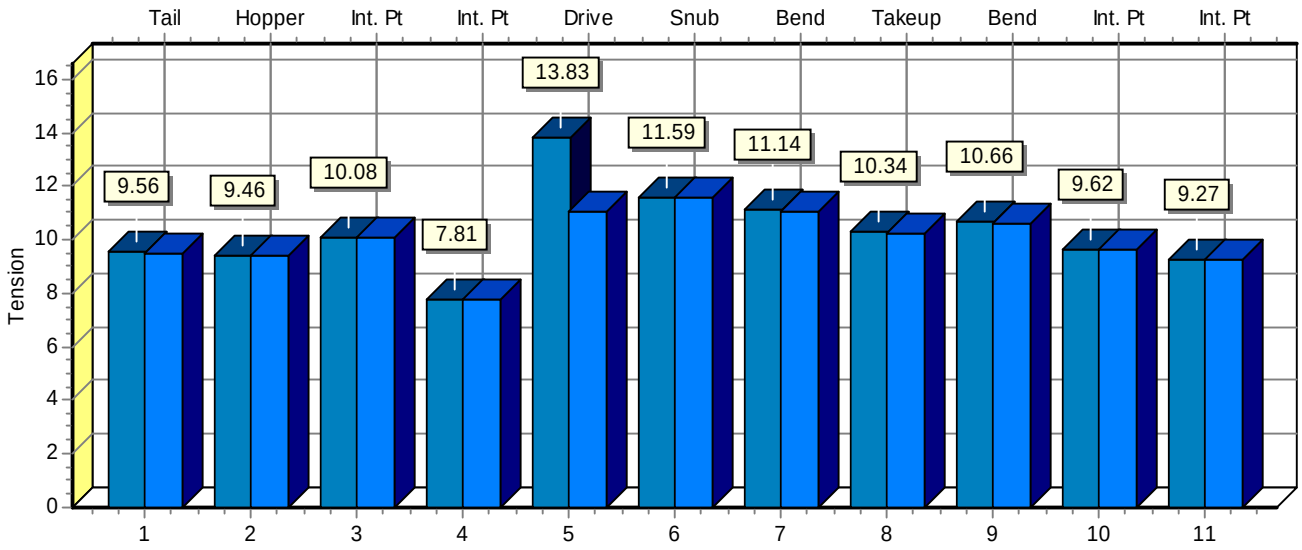


Belt Tensions - Braking Empty

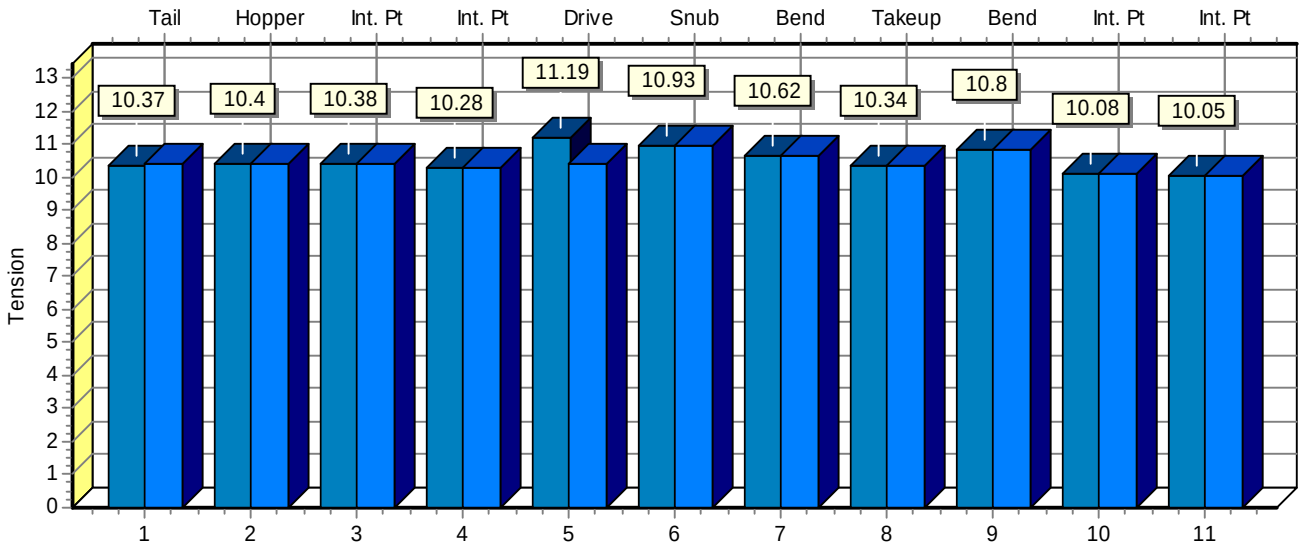


Conveyor Belt Tensions

Belt Tensions - Coasting Fully Loaded

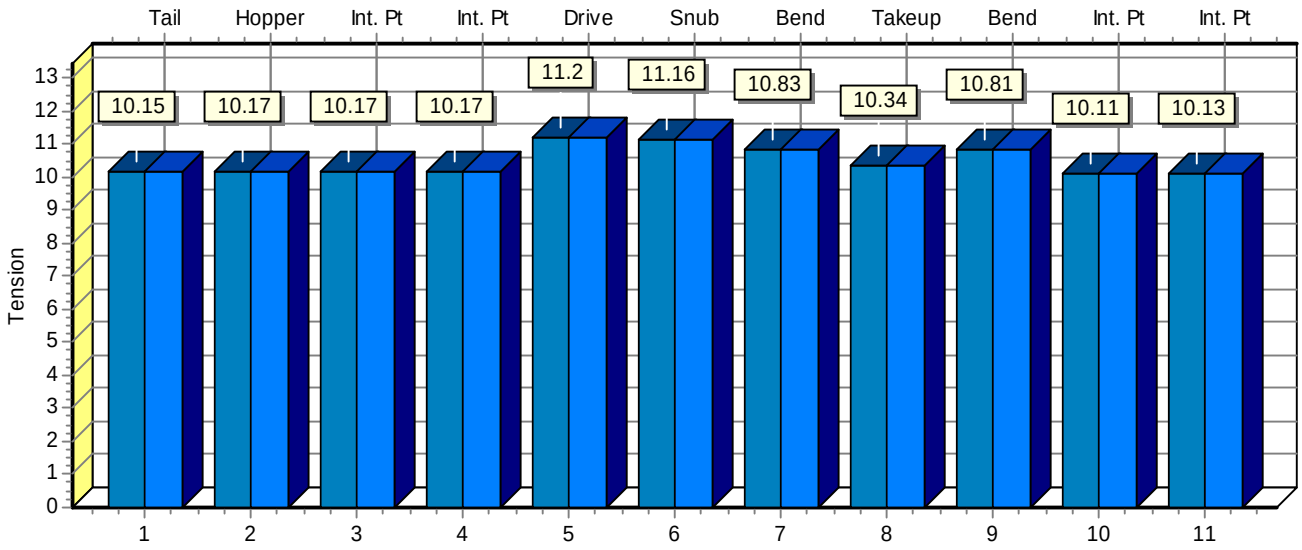


Belt Tensions - Coasting Empty



Conveyor Belt Tensions

Belt Tensions - Conveyor Stationary



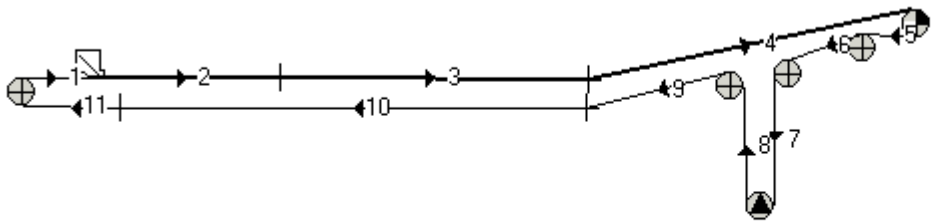
Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

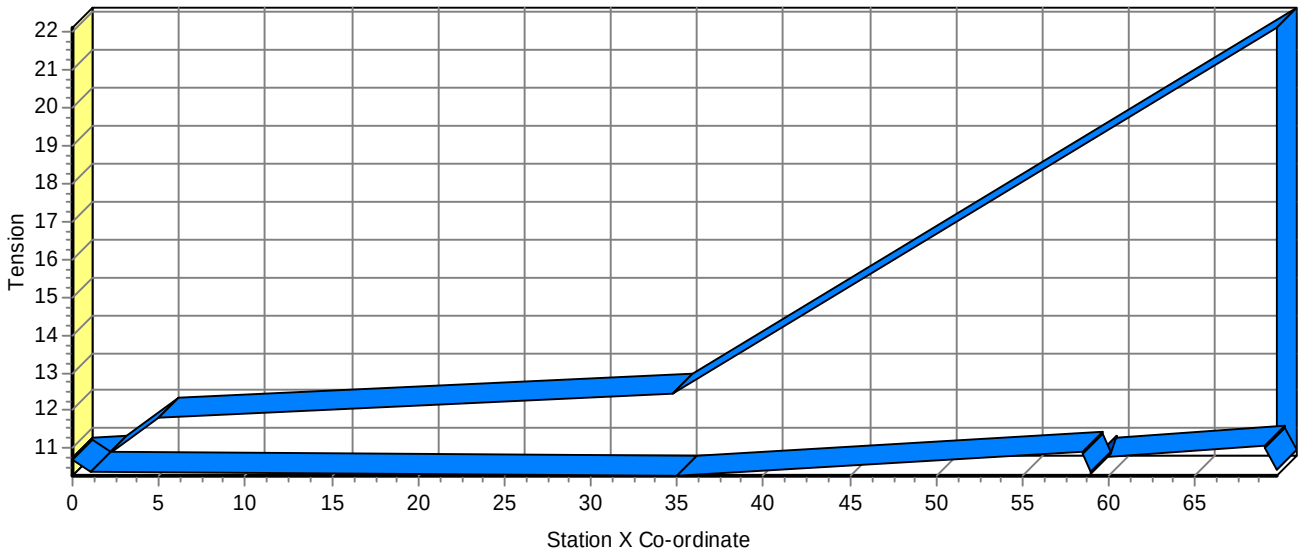
Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

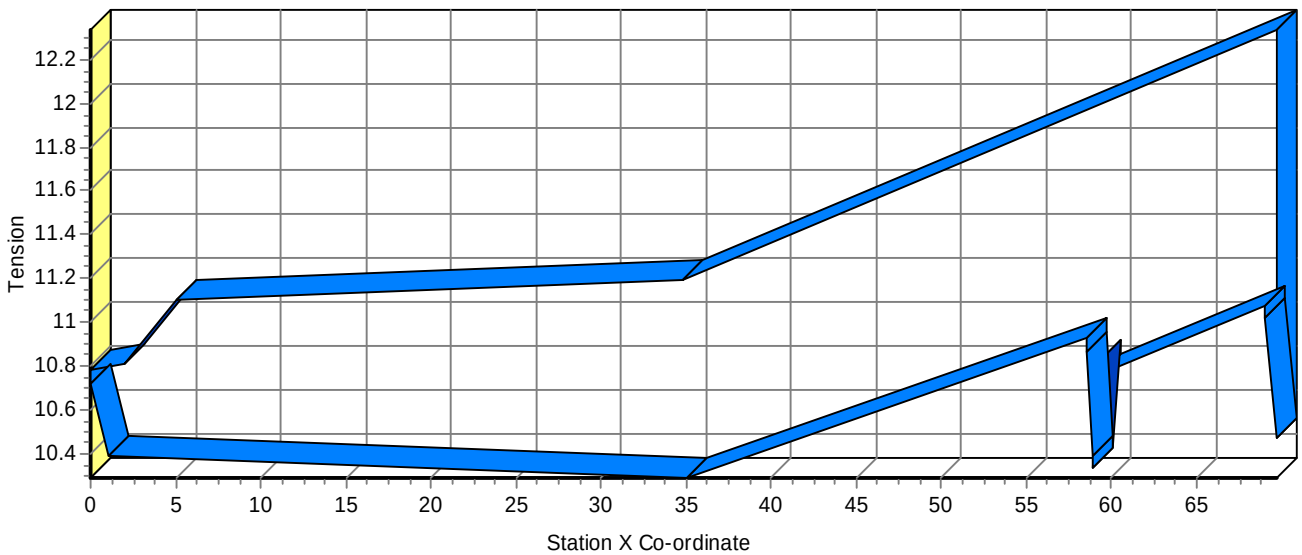
Conveyor Tension Graphs



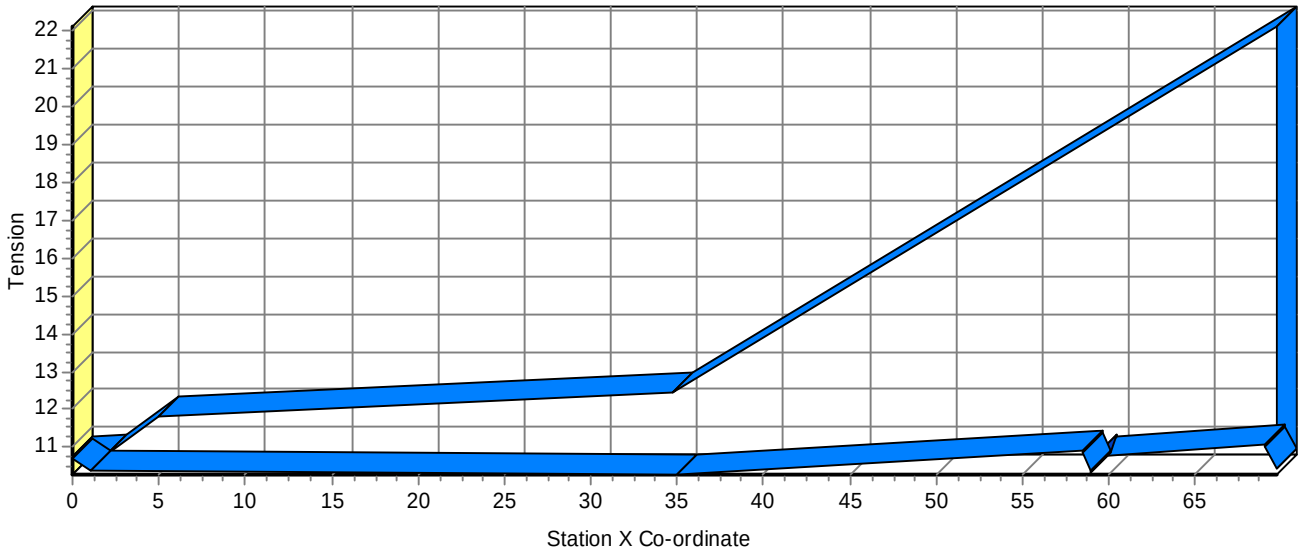
Running Tensions - Fully Loaded



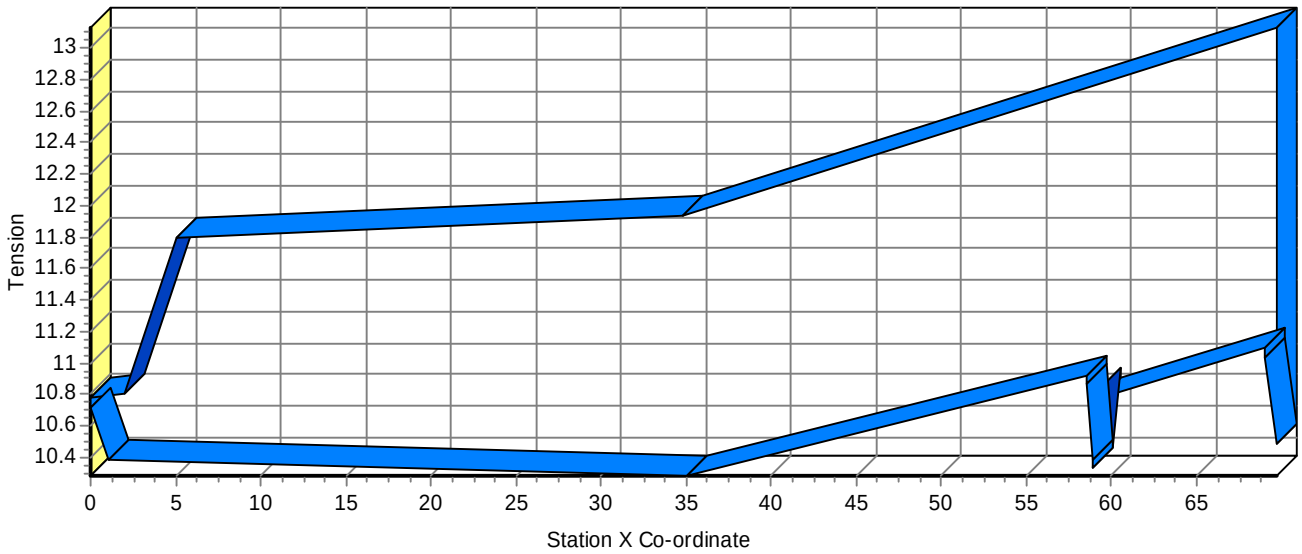
Running Tensions - Empty Belt



Running Tensions - Inclines Loaded

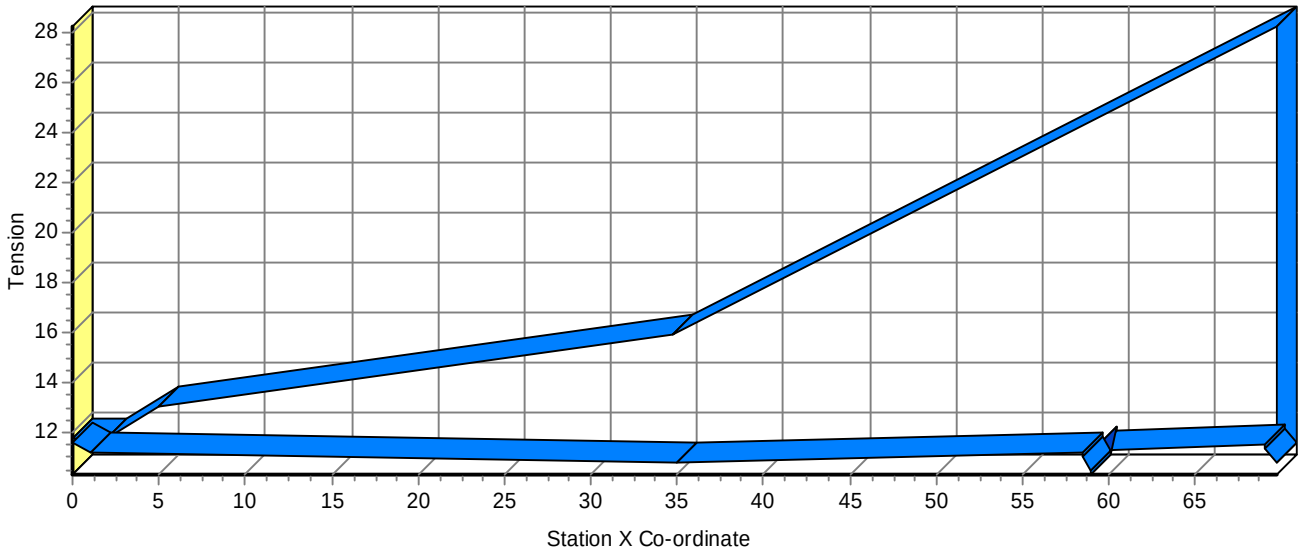


Running Tensions - Declines Loaded

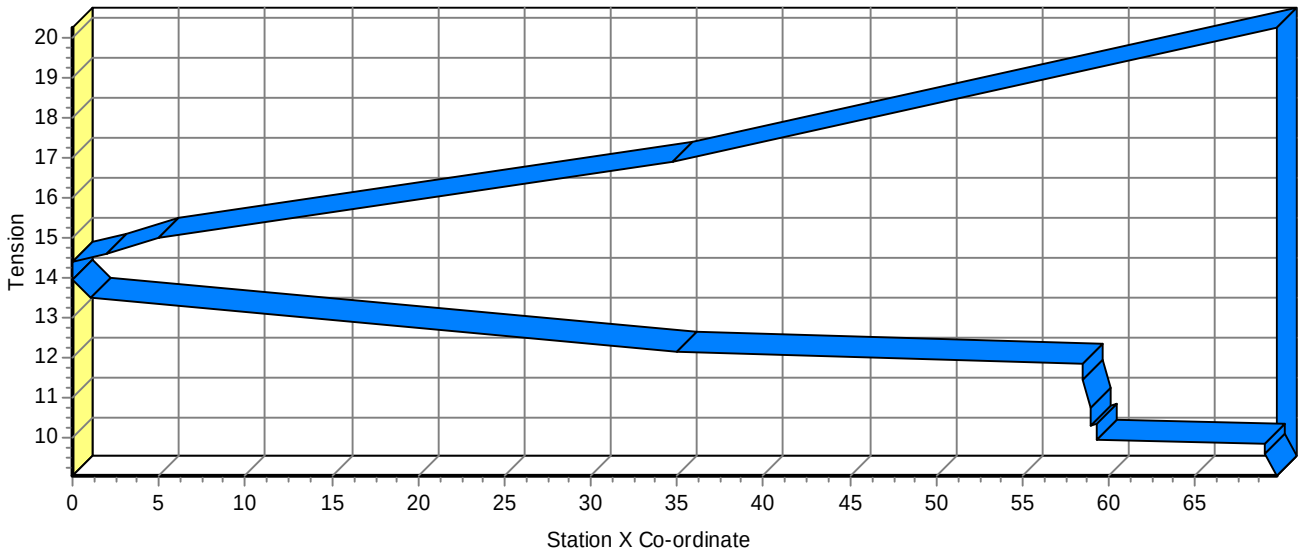


Conveyor Belt Tensions

Belt Tensions - Starting Fully Loaded

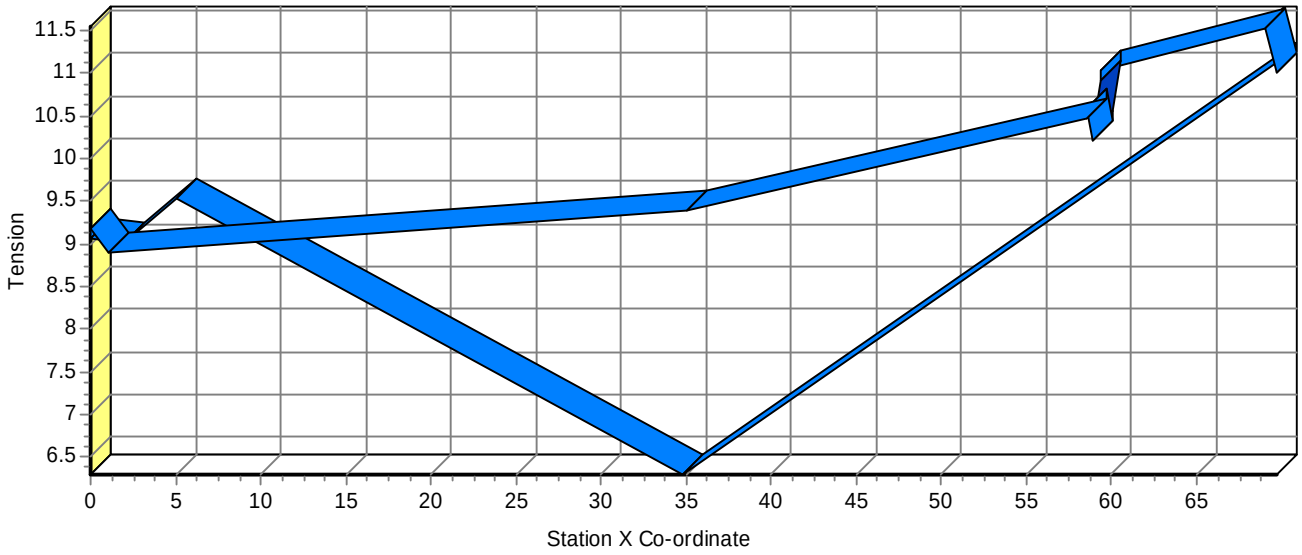


Belt Tensions - Starting Empty

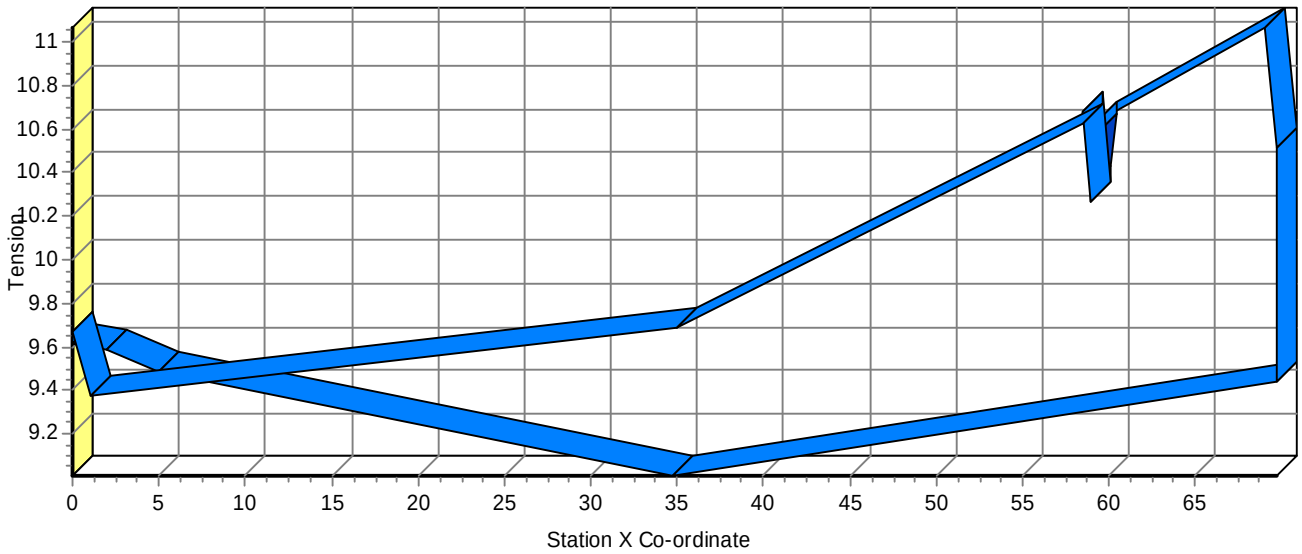


Conveyor Belt Tensions

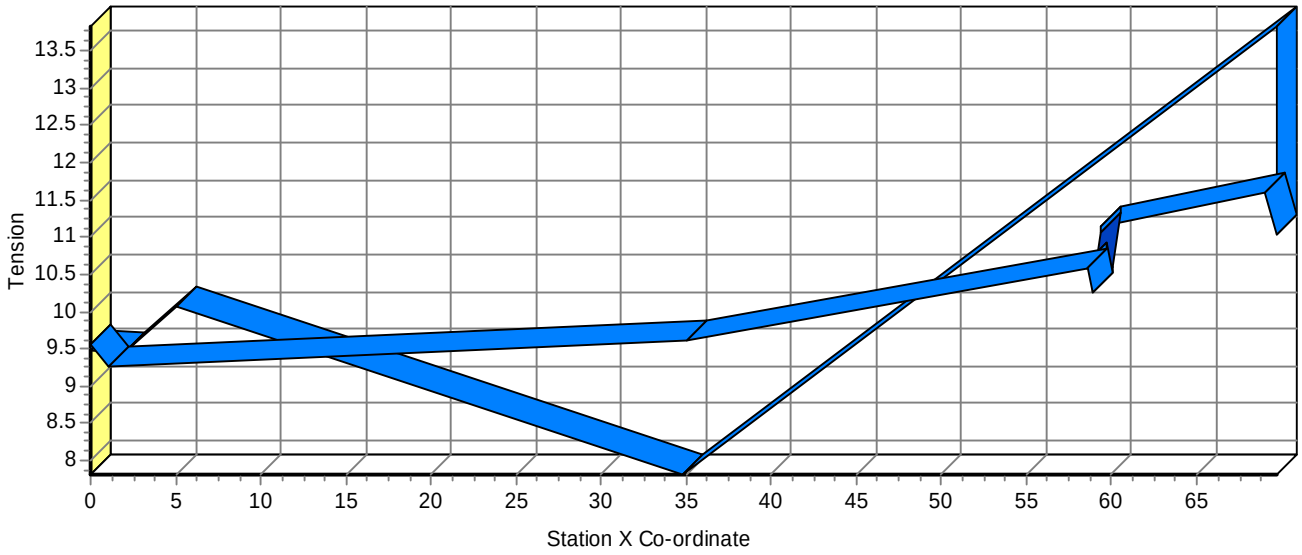
Belt Tensions - Braking Fully Loaded



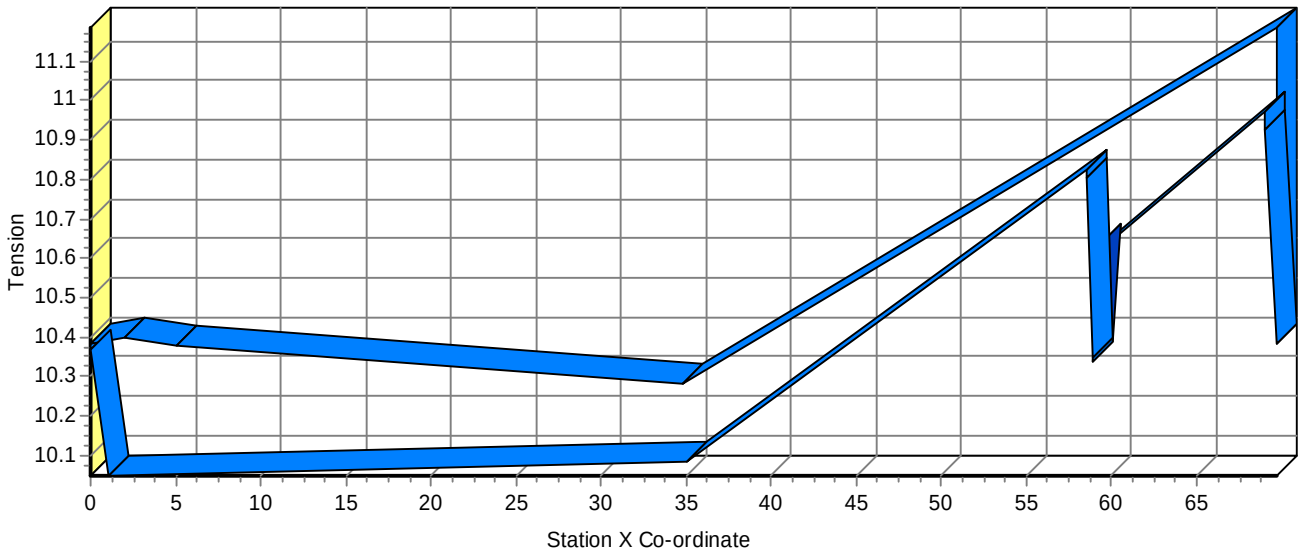
Belt Tensions - Braking Empty



Belt Tensions - Coasting Fully Loaded

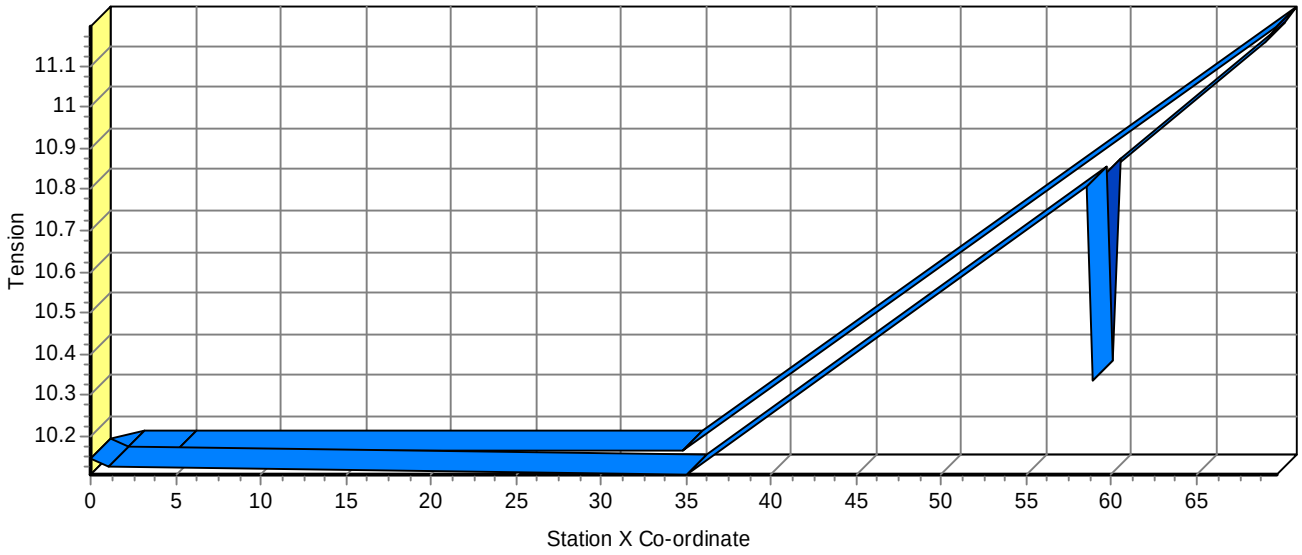


Belt Tensions - Coasting Empty



Conveyor Belt Tensions

Belt Tensions - Conveyor Stationary



Designers Comments:

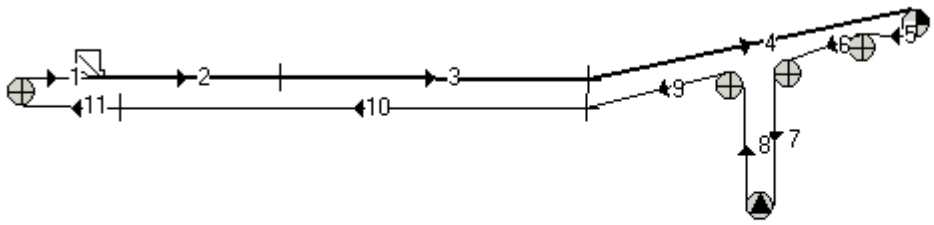
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Conveyor Tensions Declines Loaded

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Declines & Level Sections Loaded Tensions



Station		Station / Pulley: Tensions T1 Run kN	T2 Run kN	Pulley Tp kN	Drive Te kN	Conveyor Section: Section Length m	Section Lift m	Matl. Accel. Tension kN	Skirt Friction Tension kN	Scraper Friction Tension kN	Section Effective Tension kN	Friction Factor
1	Tail	10.72	10.78	0.06		2.02	0.25				0.03	0.0160
2	Hopper	10.81	10.81			3	0	0.65	0.27		0.07	0.0206
3	Int. Pt	11.8	11.8			29.75	0.05				0.14	0.0160
4	Int. Pt	11.94	11.94			36.69	11.15				1.19	0.0160
5	Drive	13.13	10.49	0.06	2.69	0.81	-0.4			0.59	-0.04	0.0188
6	Snub	11.04	11.1	0.06		10.35	-3.6				-0.31	0.0192
7	Bend	10.79	10.85	0.06		5.41	-5.4				-0.49	0.0192
8	Takeup	10.34	10.39	0.05		5.12	5.1				0.48	0.0194
9	Bend	10.87	10.93	0.06		24.7	-7.6				-0.64	0.0193
10	Int. Pt	10.29	10.29			34	0.2				0.1	0.0193
11	Int. Pt	10.39	10.39			1.03	0.25			0.3	0.03	0.0160
Totals:				0.35	2.69	152.88	0	0.65	0.27	0.89	0.56	

Maximum Tension	22.1 kN	Total Effective Tension	2.74 kN
Minimum Tension	10.29 kN	Total Belt Power (Te x V)	8.22 kW
Average Tension Fully Loaded	11.28 kN	Belt Modulus	2,070 kN/m
Average Tension Belt Stationary	10.42 kN	Total Belt Length	155.87 m
Average Tension Difference	0.86 kN	Belt Elastic Elongation	0.087 m
		Takeup Movement	0.043 m

Designers Comments:

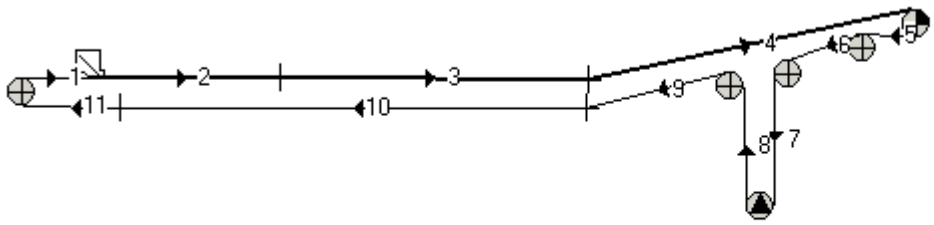
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Conveyor Tensions-Empty Belt

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Empty Belt Running Tensions



Station		Station / Pulley: T1 Run kN	T2 Run kN	Pulley Tp kN	Drive Te kN	Conveyor Section: Section Length m	Section Lift m	Matl. Accel. Tension kN	Skirt Friction Tension kN	Scraper Friction Tension kN	Section Effective Tension kN	Friction Factor
1	Tail	10.72	10.78	0.06		2.02	0.25				0.03	0.0160
2	Hopper	10.81	10.81			3	0		0.27		0.02	0.0160
3	Int. Pt	11.1	11.1			29.75	0.05				0.1	0.0160
4	Int. Pt	11.2	11.2			36.69	11.15				1.14	0.0160
5	Drive	12.34	10.47	0.06	1.89	0.81	-0.4			0.59	-0.04	0.0189
6	Snub	11.02	11.08	0.06		10.35	-3.6				-0.31	0.0192
7	Bend	10.77	10.83	0.06		5.41	-5.4				-0.49	0.0192
8	Takeup	10.34	10.39	0.05		5.12	5.1				0.48	0.0194
9	Bend	10.87	10.93	0.06		24.7	-7.6				-0.64	0.0193
10	Int. Pt	10.29	10.29			34	0.2				0.1	0.0193
11	Int. Pt	10.39	10.39			1.03	0.25			0.3	0.03	0.0160
Totals:				0.35	1.89	152.88	0		0.27	0.89	0.42	

Maximum Tension	12.34 kN	Total Effective Tension	1.93 kN
Minimum Tension	10.29 kN	Total Belt Power (Te x V)	5.79 kW
Average Tension Fully Loaded	10.96 kN	Belt Modulus	2,070 kN/m
Average Tension Belt Stationary	10.42 kN	Total Belt Length	155.87 m
Average Tension Difference	0.54 kN	Belt Elastic Elongation	0.054 m
		Takeup Movement	0.027 m

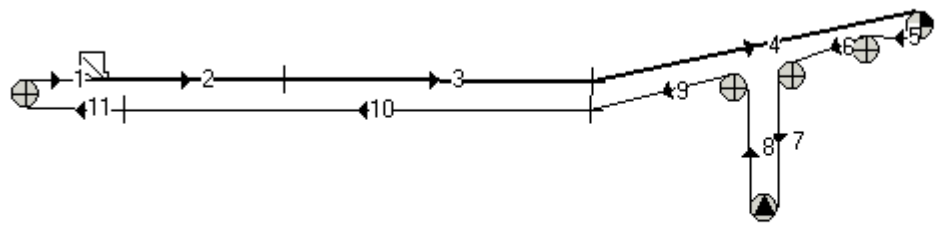
Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Fully Loaded Tensions



Station		Station / Pulley: T1 Run kN	T2 Run kN	Pulley Tp kN	Drive Te kN	Conveyor Section: Section Length m	Section Lift m	Matl. Accel. Tension kN	Skirt Friction Tension kN	Scraper Friction Tension kN	Section Effective Tension kN	Friction Factor
1	Tail	10.72	10.78	0.06		2.02	0.25				0.03	0.0160
2	Hopper	10.81	10.81			3	0	0.65	0.27		0.07	0.0206
3	Int. Pt	11.8	11.8			29.75	0.05				0.67	0.0233
4	Int. Pt	12.47	12.47			36.69	11.15				9.63	0.0232
5	Drive	22.1	10.47	0.08	11.7	0.81	-0.4			0.59	-0.04	0.0180
6	Snub	11.02	11.08	0.06		10.35	-3.6				-0.31	0.0192
7	Bend	10.77	10.83	0.06		5.41	-5.4				-0.49	0.0192
8	Takeup	10.34	10.39	0.05		5.12	5.1				0.48	0.0194
9	Bend	10.87	10.93	0.06		24.7	-7.6				-0.64	0.0193
10	Int. Pt	10.29	10.29			34	0.2				0.1	0.0193
11	Int. Pt	10.39	10.39			1.03	0.25			0.3	0.03	0.0160
Totals:				0.37	11.7	152.88	0	0.65	0.27	0.89	9.53	

Maximum Tension	22.1 kN	Total Effective Tension	11.71 kN
Minimum Tension	10.29 kN	Total Belt Power (Te x V)	35.13 kW
Average Tension Fully Loaded	12.45 kN	Belt Modulus	2,070 kN/m
Average Tension Belt Stationary	10.42 kN	Total Belt Length	155.87 m
Average Tension Difference	2.03 kN	Belt Elastic Elongation	0.204 m
		Takeup Movement	0.102 m

Designers Comments:

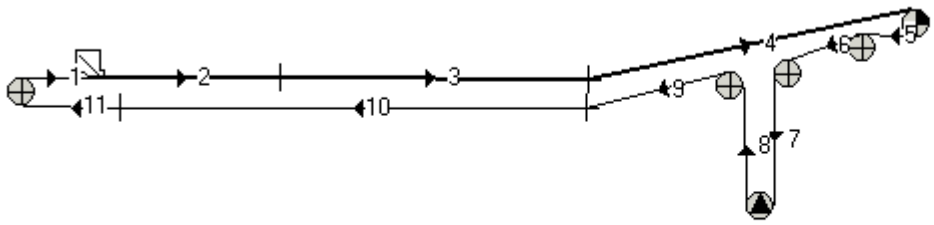
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Conveyor Tensions Inclines Loaded

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Inclines & Level Sections Loaded Tensions



Station		Station / Pulley: Tensions T1 Run kN	T2 Run kN	Pulley Tp kN	Drive Te kN	Conveyor Section: Section Length m	Section Lift m	Matl. Accel. Tension kN	Skirt Friction Tension kN	Scraper Friction Tension kN	Section Effective Tension kN	Friction Factor
1	Tail	10.72	10.78	0.06		2.02	0.25				0.03	0.0160
2	Hopper	10.81	10.81			3	0	0.65	0.27		0.07	0.0206
3	Int. Pt	11.8	11.8			29.75	0.05				0.67	0.0233
4	Int. Pt	12.47	12.47			36.69	11.15				9.63	0.0232
5	Drive	22.1	10.47	0.08	11.7	0.81	-0.4			0.59	-0.04	0.0180
6	Snub	11.02	11.08	0.06		10.35	-3.6				-0.31	0.0192
7	Bend	10.77	10.83	0.06		5.41	-5.4				-0.49	0.0192
8	Takeup	10.34	10.39	0.05		5.12	5.1				0.48	0.0194
9	Bend	10.87	10.93	0.06		24.7	-7.6				-0.64	0.0193
10	Int. Pt	10.29	10.29			34	0.2				0.1	0.0193
11	Int. Pt	10.39	10.39			1.03	0.25			0.3	0.03	0.0160
Totals:				0.37	11.7	152.88	0	0.65	0.27	0.89	9.53	

Maximum Tension	22.1 kN	Total Effective Tension	11.71 kN
Minimum Tension	10.29 kN	Total Belt Power (Te x V)	35.13 kW
Average Tension Fully Loaded	12.45 kN	Belt Modulus	2,070 kN/m
Average Tension Belt Stationary	10.42 kN	Total Belt Length	155.87 m
Average Tension Difference	2.03 kN	Belt Elastic Elongation	0.204 m
		Takeup Movement	0.102 m

Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Vertical Curves

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Vertical Curve Radius Calculations

Belt Mass - New Belt	*9.41* kg/m	% Belt Mass for Lift-off Calculation	*75* %
Top Cover Mass - New Belt	*5.08* kg/m	Curve Tension Safety Factor	*1*
Bottom Cover Mass	*1.7* kg/m	Average Drive Torque Start-up Factor - Loaded	140 %
Worn Belt Mass	7.05 kg/m	Average Drive Torque Start-up Factor - Empty	140 %
Reduction of Top Cover Mass	46 %	Belt Modulus	*2070* kN/m
Conveyed Material Mass	*71.94* kg/m	Belt Rated Tension	*31.5* kN/m
		Allowable Edge Tension Rise	*15* %

Point No	Curve Type	Load Capacity tonnes/hr	Design Vertical Curve Radius m	Running				Starting				Braking				Max. Radius m
				Fully Loaded		Empty		Fully Loaded		Empty		Fully Loaded		Empty		
				Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	
1	Tail			10.72		10.72		11.58		13.97		9.18		9.67		
2	Hopper	777		10.81		10.81		11.81		14.6		9.01		9.59		
3	Int. Pt	Concave	777	11.8	171	11.1	160	13.07	189	14.99	217	9.52	138	9.49	137	**217**
	Min. Edge Tension Radius				13		13		11		10		16		16	
	Max. Centre Tension Radius				5		5		5		6		4		4	
4	Int. Pt	Concave	777	12.47	180	11.2	162	15.93	230	16.91	244	6.29	91	9.01	130	**244**
	Min. Edge Tension Radius				12		13		9		9		24		16	
	Max. Centre Tension Radius				5		5		7		7		4		4	
5	Drive			22.1		12.34		28.24		20.25		11.13		9.44		
6	Snub			11.02		11.02		11.4		9.64		11.55		11.06		
7	Bend			10.77		10.77		11.29		9.94		11.04		10.63		
8	Takeup			10.34		10.34		10.34		10.34		10.34		10.34		
9	Bend			10.87		10.87		11.02		11.44		10.59		10.68		

Vertical Curves

Point No	Curve Type	Load Capacity tonnes/hr	Design Vertical Curve Radius m	Running				Starting				Braking				Max. Radius m
				Fully Loaded		Empty		Fully Loaded		Empty		Fully Loaded		Empty		
				Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	Tension kN	Radius m	
10 Int. Pt	Concave		150	10.29	149	10.29	149	10.78	156	12.16	176	9.4	136	9.69	140	**176**
Min. Edge Tension Radius					14		14		14		12		16		15	
Max. Centre Tension Radius					1		1		1		2		1		1	
11 Int. Pt	Concave			10.39	150	10.39	150	11.22	162	13.52	196	8.9	129	9.38	136	**196**
Min. Edge Tension Radius					14		14		13		11		17		16	
Max. Centre Tension Radius					1		1		1		2		1		1	

Designers Comments:

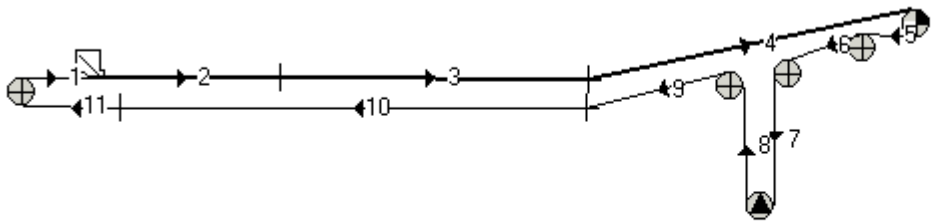
Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Tension Summary

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Idler and Belt Resonance Report



Belt Speed	*3* m/s	Takeup Mass	2108 kg
Carry Idler Roll Diameter	*152* mm	*1.5* % Sag Tension	7.98
Return Idler Roll Diameter	*127* mm	5% Sag Tension	1.99 kN

Point No		*Running Fully Loaded Belt Resonance* Start Belt Tension kN	End Belt Tension kN	Belt Transverse Wave Frequency Range Hz to Hz	Idler Roll Excitation Frequency Hz	Section Idler Spacing m	Critical Idler Spacing Start m	Critical Idler Spacing End m	Idler Spacing within +/- 10%
1	Tail	10.39	10.72	16.48 to 16.74	6.28	*1.00*	**2.62**	**2.67**	OK
2	Hopper	10.78	10.81	10.73 to 10.74	6.28	*0.50*	**0.85**	**0.86**	OK
3	Int. Pt	10.81	11.80	3.58 to 3.76	6.28	*1.50*	**0.86**	**0.90**	OK
4	Int. Pt	11.80	12.47	3.76 to 3.88	6.28	*1.50*	**0.90**	**0.93**	OK
5	Drive	12.47	22.10	6.03 to 8.05	7.52	*3.00*	**2.40**	**3.21**	Warning [1]
6	Snub	10.47	11.02	5.51 to 5.66	7.52	*3.00*	**2.20**	**2.26**	OK
7	Bend	11.08	10.77	5.68 to 5.59	7.52	*3.00*	**2.26**	**2.23**	OK
8	Takeup	10.83	10.34	5.61 to 5.48	7.52	*3.00*	**2.24**	**2.19**	OK
9	Bend	10.39	10.87	5.49 to 5.62	7.52	*3.00*	**2.19**	**2.24**	OK
10	Int. Pt	10.93	10.29	5.64 to 5.47	7.52	*3.00*	**2.25**	**2.18**	OK
11	Int. Pt	10.29	10.39	16.40 to 16.48	6.28	*1.00*	**2.61**	**2.62**	OK

Designers Comments:

Note Belt lift during starting due to light belt and tight geometry of conveyor. Refer to Vertical curves report. Starting torque should be reduced if possible. Suggest using a VVVF drive to reduce starting torque and removing the Fluid Coupling. This would also result in a better match with the Shaft mounted gearbox.

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Discharge Trajectory Report

Belt Speed	*4* m/s	Number of Calc Increments	*20*
Discharge Radius at Belt Line	*0.5* m	Belt Incline Angle (-Decline)	*18* deg
Discharge Radius at Load Line	*0.6* m	Time after Discharge	*1.5* sec

Calc No	Co-ordinates Measured from Pulley Centre Line		
	Time, t sec	Fall, H m	Distance X m
0	0.000	0.476	-0.155
1	0.075	0.541	0.131
2	0.150	0.551	0.416
3	0.225	0.505	0.701
4	0.300	0.405	0.987
5	0.375	0.250	1.272
6	0.450	0.039	1.557
7	0.525	-0.227	1.843
8	0.600	-0.548	2.128
9	0.675	-0.924	2.413
10	0.750	-1.356	2.699
11	0.825	-1.842	2.984
12	0.900	-2.384	3.269
13	0.975	-2.981	3.555
14	1.050	-3.633	3.840
15	1.125	-4.340	4.125
16	1.200	-5.102	4.411
17	1.275	-5.919	4.696
18	1.350	-6.792	4.981
19	1.425	-7.720	5.267
20	1.500	-8.703	5.552

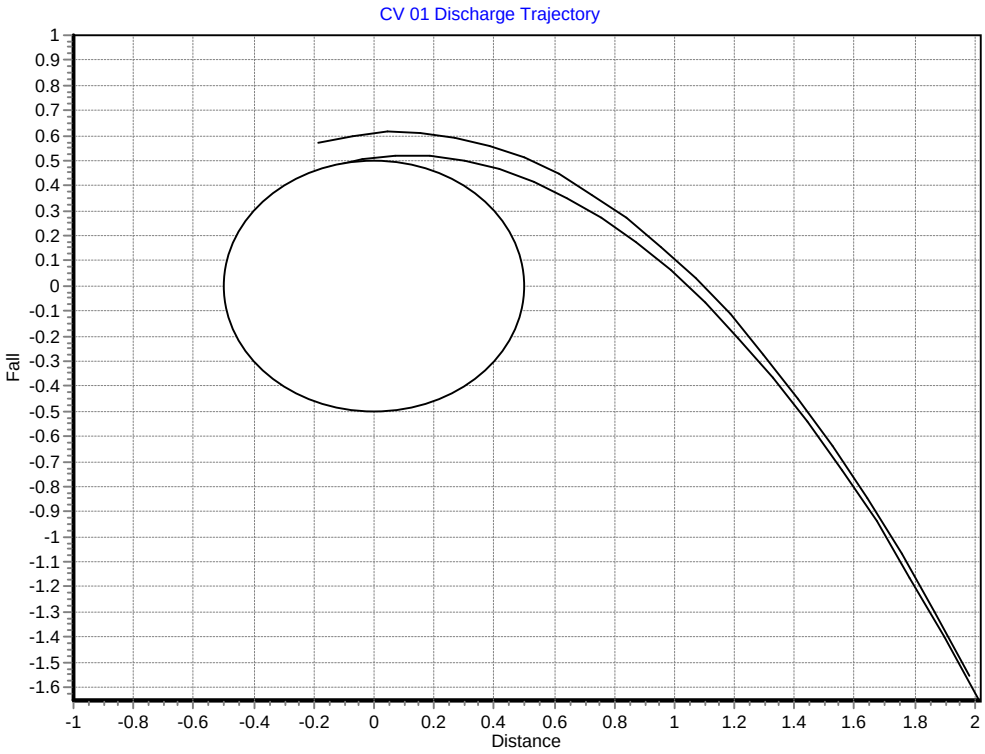
Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Discharge Trajectory Report

Belt Speed	*3* m/s	Number of Calc Increments	*20*
Discharge Radius at Belt Line	*0.5* m	Belt Incline Angle (-Decline)	*18* deg
Discharge Radius at Load Line	*0.6* m	Time after Discharge	*0.8* sec

Calc No	Co-ordinates Measured from Pulley Centre Line		
	Time, t sec	Fall, H m	Distance X m
0	0.000	0.476	-0.155
1	0.040	0.505	-0.040
2	0.080	0.518	0.074
3	0.120	0.516	0.188
4	0.160	0.498	0.302
5	0.200	0.465	0.416
6	0.240	0.416	0.530
7	0.280	0.351	0.644
8	0.320	0.270	0.759
9	0.360	0.174	0.873
10	0.400	0.062	0.987
11	0.440	-0.066	1.101
12	0.480	-0.209	1.215
13	0.520	-0.368	1.329
14	0.560	-0.543	1.443
15	0.600	-0.733	1.557
16	0.640	-0.940	1.672
17	0.680	-1.161	1.786
18	0.720	-1.399	1.900
19	0.760	-1.652	2.014
20	0.800	-1.921	2.128


CV 01 Discharge Trajectory
Fall
Distance
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0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
-1
-1.1
-1.2
-1.3
-1.4
-1.5
-1.6
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2

Helix Technologies Pty Ltd

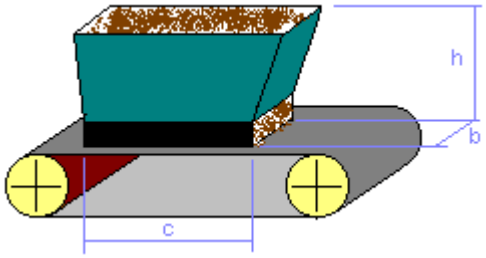
Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Feeder / Hopper Pull-out Force

Input Data

Bruff's Method

Width of Hopper Bottom	b	***0.5***	m
Length of Hopper Bottom	c	***10***	m
Effective Height of Material	h	***2***	m
Bulk Density of Material	D	***1,300***	kg/m3
Co-efficient of Friction	*u*	***0.4***	
Material "Flow" Factor - Starting	n_s	***4***	
Material "Flow" Factor - Running	n_s	***1***	
Feeder Belt Speed	V	***0.0946***	m/s



Calculation Results

Pull-out Resistance from Hopper - Starting	Fs	**97.13**	kN
Pull-out Resistance from Hopper - Running	Fr	**24.28**	kN
Pull-out Power Required - Starting	Ps	**9.19**	kW
Pull-out Power Required - Running	Pr	**2.3**	kW

$$F = \frac{2c^2b^2}{c+b} * u \frac{Dg}{1000} * n_s$$

Helix Technologies Pty Ltd

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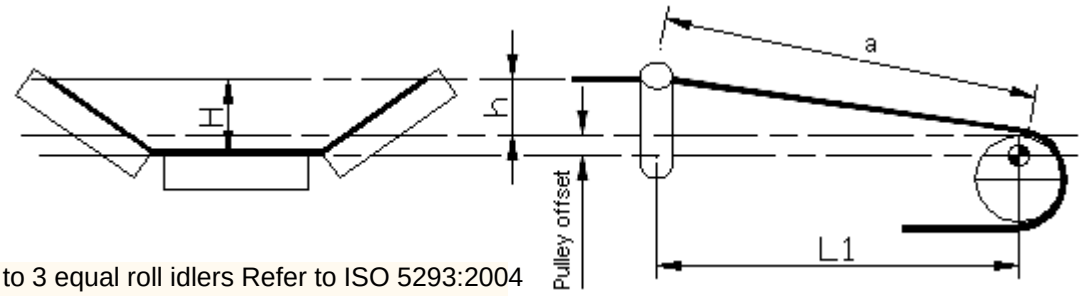
Trough Transition Distance



Applies to 3 equal roll idlers Refer to ISO 5293:2004

Input Data

Description **Description or location of transition**

Idler Trough Angle	lambda	***35***	deg	
Belt Width	b	***750***	mm	
Belt Modulus	M	***2,070***	kN/m	
Transition Depth h (h = H - offset)	h	***110***	mm	
Belt Rated Operating Tension	Tr	***31.5***	kN/m	***315/2***
Belt Tension at Pulley (running)	T1	***22***	kN	
Belt Tension at Pulley (starting)	T1s	***28***	kN	
Allowable Edge Tension Rise running %	F	***15***	% (default = 15% i.e f=1.15)	
Allowable Edge Tension Rise starting %	Fs	***67***	% (default = 167% i.e f=1.67)	

Calculation Results

$$L_1 = \frac{h}{Sin\lambda}\sqrt{\frac{M}{\Delta T}(1 - Cos\lambda)}$$

Minimum Transition Distance for Edge Tension, running	L1e	**1,154**	mm
Minimum Transition Distance for Edge Tension, starting	L1s	**775**	mm
Minimum Transition Distance for Centre Tension > 0	L1c	**382**	mm
Required Transition Distance	L1	**1,154**	mm

Pulley Inertia Calculation

Helix Technologies Pty Ltd

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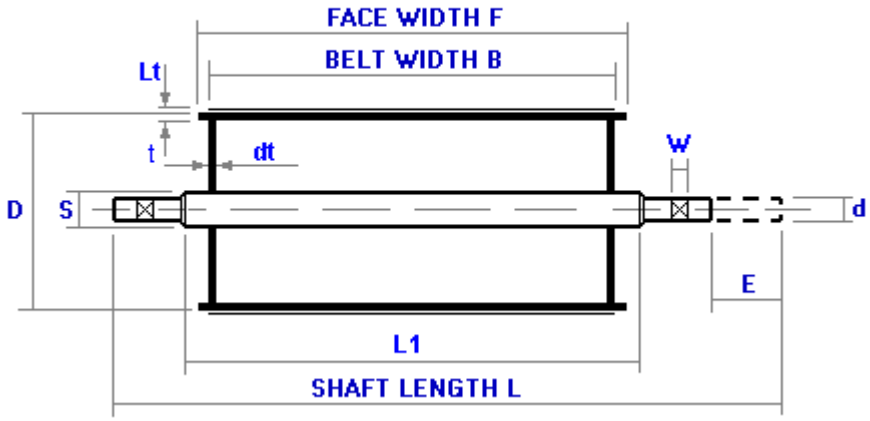
Pulley Inertia J



Input Data

Description **Description or location of pulley**

Pulley Face Width	F	***1,400***	mm
Pulley Diameter over steel	D	***1,000***	mm
Steel Shell thicknes	t	***20***	mm
Rubber Lagging thickness	Lt	***12***	mm
End Disc thickness	Dt	***50***	mm
Shaft Dimension length L1	L1	***1,100***	mm
Overall Shaft length	L	***1,800***	mm
Shaft Dia at Hub	S	***200***	mm
Shaft Dia at Bearing	d	***160***	mm

Calculation Results

Shaft Mass		**382**	kg
Pulley Shell mass (including lagging)		**1,305**	kg
Total Assembly Inertia J	J	**245.04**	kg-m2

Helix Technologies Pty Ltd

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Calculate Bearing Life

Input Data

Pulley Number		***99***		
Pulley Description		***Pulley Drive Factor check***		
Radial Load on Bearing	P	***1,080.5***	N	(half pulley load)
Bearing Dynamic Load Rating	C	***14,000***	N	
Bearing Rotating Speed	N	***565***	rpm	

$$L10h = \frac{\left(\frac{C}{P}\right)^{p} \times 10^{6}}{60 \times N}$$

Calculation Results

Bearing Life	L10h	**64,167**	hrs

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
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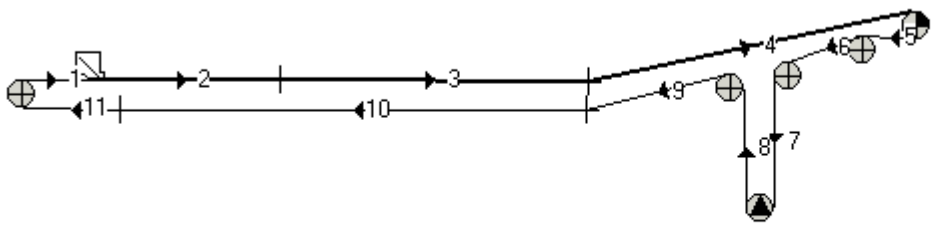
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Cost Report



Category	Description	Unit	Quantity	Rate	Total Cost	Margin	Selling Price
Accessories	**Accessories**						
Accessories	Dyna Sraper "T"	ea	1	2,200.00	2,200	943	3,143
Accessories	Weightometer - ACC Type 2	ea	1	8,200.00	8,200	3,514	11,714
		Accessories	**SubTotal**		**$10,400.00**		**$14,857.14**
Belt	**Belt**						
Belt	Belt Splicing	ea	1	900.00	900	386	1,286
Belt	GOODYEAR PLYLON-HI 2 Plies 1200 mm	m	70.33	152.00	10,690	4,581	15,272
		Belt	**SubTotal**		**$11,590.16**		**$16,557.37**
Civils	**Civil Work**						
Civils	Clearing & Grubbing	ha	4.68	1,250.00	5,850	2,507	8,357
Civils	Cut to Fill	m3	4500	4.75	21,375	9,161	30,536
Civils	Cut to Spoil	m3	500	3.80	1,900	814	2,714
Civils	Concrete for Footings	m3	8	1,500.00	12,000	5,143	17,143
		Civils	**SubTotal**		**$41,125.00**		**$58,750.00**
Drives	**Conveyor Drive Components**						
Drives	Gearbox size B@SH13 Ratio 16:1	ea	1	55,000.00	55,000	13,750	68,750
Drives	Fluid Coupling Voith 266 Size 56	ea	1	18,500.00	18,500	4,625	23,125
Drives	Disc Brake size USB2.1 c/w thrustor	ea	1	7,800.00	7,800	1,950	9,750
Drives	Low speed couling Flanged type 451	ea	1	2,780.00	2,780	695	3,475
Drives	Electric Motor 37kW 415 Volt 4 Pole	ea	1	2,564.00	2,564	641	3,205
Drives	Electric Motor 30kW 415 Volt 4 Pole	ea	1	2,023.00	2,023	506	2,529
Drives	VOITH TSS Size 422 75kW 140 % FLT	ea	1	13,750.00	13,750	3,438	17,188
Drives	BTR POWERTECH Size 50 37kW 200 % FLT	ea	1	7,800.00	7,800	1,950	9,750
Drives	Fenner Shaft Mounted Size H5 8.075:1 ratio	ea	1	3,600.00	3,600	900	4,500
Drives	Greaves HR 225 Size 160 8.4:1 ratio	ea	1	12,400.00	12,400	3,100	15,500
Drives	Base plates	ea	2	1,400.00	2,800	700	3,500
		Drives	**SubTotal**		**$129,017.00**		**$161,271.25**
Electrical	**Electrical**						
Electrical	Transformer 3.3 kV 150 kVa	ea	1	15,000.00	15,000	3,750	18,750

Category	Description	Unit	Quantity	Rate	Total Cost	Margin	Selling Price
Electrical	MCC for Drive 1 - 75 kW	ea	1	8,000.00	8,000	2,000	10,000
Electrical	MCC for Drive 2 -37 kW	ea	1	6,500.00	6,500	1,625	8,125
Electrical	Pull Wire Switch (NHP)	ea	2	450.00	900	225	1,125
Electrical	Pull Wire	m	100	2.50	250	63	313
Electrical	Cabling 4mm2	m	74	8.50	629	157	786
Electrical	Cabling 16mm2 c/w trays	m	125	15.50	1,938	484	2,422
Electrical	Zero Speed Switch	ea	1	200.00	200	50	250
		Electrical	**SubTotal**		**$33,416.50**		**$41,770.62**
EPCM	**Engineering, Procurement etc**						
EPCM	Drawings	hr	300	45.00	13,500	3,375	16,875
EPCM	Engineering Design	hr	20	70.00	1,400	350	1,750
EPCM	Project Management	hr	15	80.00	1,200	300	1,500
EPCM	Secretarial	hr	20	25.00	500	125	625
EPCM	Procurement Costs	hr	20	50.00	1,000	250	1,250
EPCM	Head office overheads	LS	1	2,000.00	2,000	500	2,500
		EPCM	**SubTotal**		**$19,600.00**		**$24,500.00**
Freight	**Transport & Freight**						
Freight	Packing	LS	1	2,000.00	2,000	857	2,857
Freight	Export Documnetation	set	1	850.00	850	364	1,214
Freight	Transport to Dock	trips	3	350.00	1,050	450	1,500
		Freight	**SubTotal**		**$3,900.00**		**$5,571.43**
Idlers	**Idlers**						
Idlers	Impact Idler - 3 Roll offset 1050	ea	5	261.00	1,305	326	1,631
Idlers	Trough Training 3 Roll 1050	ea	4	465.00	1,860	465	2,325
Idlers	Series 20, 3 Roll Carry, 152 Plain Inline Series 20 3 roll x 152	ea	27	120.00	3,240	810	4,050
Idlers	Series 15 1 Roll Flat Carry, 127 Dia Series 15 1 roll x 127	ea	15	104.00	1,560	390	1,950
		Idlers	**SubTotal**		**$7,965.00**		**$9,956.25**
Installation	**Installation & Commissioning**						
Installation	Cranage 15t hire	hr	30	50.00	1,500	643	2,143
Installation	Assembly labour	hr	250	45.00	11,250	4,821	16,071
Installation	Commisioning Visit	ea	1	2,500.00	2,500	1,071	3,571
		Installation	**SubTotal**		**$15,250.00**		**$21,785.71**
Pulleys	**Pulleys & Shafts**						
Pulleys	Tail Pulley No 1-505 dia x 1350 mm	kg	330.78	6.00	1,985	851	2,835
Pulleys	Shaft Tail Pulley No 1-150 dia x 1800 mm	kg	296.86	4.92	1,461	626	2,087
Pulleys	Bearing Tail Pulley No 1-125 dia SN3028	ea	2	.00	0	0	0
Pulleys	Drive Pulley No 4-600 dia x 1350 mm	kg	684.17	6.00	4,105	1,759	5,864
Pulleys	Shaft Drive Pulley No 4-150 dia x 1800 mm	kg	296.86	4.92	1,461	626	2,087
Pulleys	Bearing Drive Pulley No 4-125 dia SN3028	ea	2	.00	0	0	0
Pulleys	Bend Pulley No 5-505 dia x 1350 mm	kg	330.78	6.00	1,985	851	2,835
Pulleys	Shaft Bend Pulley No 5-150 dia x 1800 mm	kg	296.86	4.92	1,461	626	2,087
Pulleys	Bearing Bend Pulley No 5-125 dia SN3028	ea	2	.00	0	0	0

Category	Description	Unit	Quantity	Rate	Total Cost	Margin	Selling Price
Pulleys	Drive Pulley No 6-600 dia x 1350 mm	kg	684.17	6.00	4,105	1,759	5,864
Pulleys	Shaft Drive Pulley No 6-150 dia x 1800 mm	kg	296.86	4.92	1,461	626	2,087
Pulleys	Bearing Drive Pulley No 6-125 dia SN3028	ea	2	.00	0	0	0
Pulleys	Bend Pulley No 7-405 dia x 1350 mm	kg	248.32	7.20	1,788	766	2,554
Pulleys	Shaft Bend Pulley No 7-90 dia x 1800 mm	kg	102.38	5.10	522	224	746
Pulleys	Bearing Bend Pulley No 7-75 dia SNH517	ea	2	468.00	936	401	1,337
Pulleys	Pulley Pulley No 8-505 dia x 1350 mm	kg	330.78	6.00	1,985	851	2,835
Pulleys	Shaft Pulley Pulley No 8-150 dia x 1800 mm	kg	294.09	4.92	1,447	620	2,067
Pulleys	Bearing Pulley Pulley No 8-115 dia SN3026	ea	2	.00	0	0	0
Pulleys	Takeup Pulley No 9-505 dia x 1350 mm	kg	330.78	6.00	1,985	851	2,835
Pulleys	Shaft Takeup Pulley No 9-150 dia x 1800 mm	kg	296.86	4.92	1,461	626	2,087
Pulleys	Bearing Takeup Pulley No 9-125 dia SN3028	ea	2	.00	0	0	0
Pulleys	Pulley Pulley No 10-505 dia x 1350 mm	kg	330.78	6.00	1,985	851	2,835
Pulleys	Shaft Pulley Pulley No 10-150 dia x 1800 mm	kg	294.09	4.92	1,447	620	2,067
Pulleys	Bearing Pulley Pulley No 10-115 dia SN3026	ea	2	.00	0	0	0
		Pulleys	**SubTotal**		**$31,576.08**		**$45,108.69**
Steel	**Structural Steel**						
Steel	Tail Frame	t	8.2	1,250.00	10,250	4,393	14,643
Steel	Head Frame	t	2.7	1,250.00	3,375	1,446	4,821
Steel	Trusses	ea	2	4,800.00	9,600	4,114	13,714
Steel	Trestles (8m high)	ea	2	3,500.00	7,000	3,000	10,000
Steel	Takeup Tower and Frames	ea	1	5,800.00	5,800	2,486	8,286
Steel	Conveyor Covers	m	33	236.00	7,788	3,338	11,126
Steel	Walkways & Handrails	m	33	450.00	14,850	6,364	21,214
Steel	Stringers & Idler supports	t	3.5	1,250.00	4,375	1,875	6,250
Steel	Painting - Steelwork inc Sandblast & Primer	m2	180	22.50	4,050	1,736	5,786
		Steel	**SubTotal**		**$67,088.00**		**$95,840.00**
Sub	**Subcontract**						
Sub	None allowed for this conveyor	ea	1	.00	0	0	0
		Sub	**SubTotal**		**$0.00**		**$0.00**
				Total	**$370,927.74**	**25.21%**	**$495,968.47**

Conveyor Equipment Schedule

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Equipment Schedule - Conveyor Summary

Conveyor Number	Conveying Distance m	Net Lift m	Capacity tonnes	Belt Speed m/s	Absorbed Power kW	Installed Power kW	Belt Width mm	Belt Class	Effective Tension kN	Max. Run Tension kN	Takeup Mass kg	Trough Angle deg	Carry Idler Spacing m	Return Idler Spacing m
CV 01	69.44	11.2	777	3	37.34	45	750	315/2	11.71	22.07	2,108	35	1.2	3
FDR 03	5.81	-0.4	77	0.3	4.46	7.5	1,000	500/2	13.98	48.45	7,227	20	0.5	3
CV O-Land 1	1,204.75	-14.5	777	4.5	70.23	90	900	XT 1000	14.67	80.07	9,018	35	1.2	3
CV102	2,037.44	398.9	2,000	5	2,710.05	3,000	1,200	ST 4000	514.91	712.79	41,122	35	1.7	3.4
CV102	18.08	0.34	777	4.5	21.69	29.5	900	ST1000	4.6	10.83	1,612	35	1.2	3

Helix Technologies Pty Ltd

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Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Equipment Schedule - Belts

Conveyor Number	*Belt Width mm*	*Belt Class*	*Belt Plies*	*Belt Length m*	*Top Cover Thick mm*	*Bottom Cover Thick mm*	
CV 01	**750**	**315/2**	**2**	**155.89**	**6**	**2**	
FDR 03	**1,000**	**500/2**	**2**	**17.85**	**13**	**8**	
CV O-Land 1	**900**	**XT 1000**	**3**	**2,421.12**	**6**	**2**	
CV102	**1,200**	**ST 4000**	**0**	**4,092.3**	**6**	**2**	
CV102	**900**	**ST1000**	**0**	**52.52**	**6**	**2**	

Helix Technologies Pty Ltd

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Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Equipment Schedule - Idlers

Conveyor Number	*Idler Description*	*Belt Width mm*	*Roll Dia mm*	*Shaft Dia mm*	*Trough Angle deg*	*No. of Rolls*	*No. of Idlers*	
CV 01	**Series 20 3 Roll Carry 152 Plain Inline**	**750**	**152**	**27**	**35**	**3**	**53**	**C**
CV 01	**Vee Return Series 15 2 Roll 127 Dia**	**750**	**127**	**27**	**10**	**2**	**26**	**R**
FDR 03	**Series 11 3 Roll Carry 114 Plain Offset**	**1,000**	**114**	**20**	**20**	**3**	**17**	**C**
FDR 03	**Series 05 1 Roll Flat Carry 114 Dia**	**1,000**	**114**	**27**	**0**	**1**	**16**	**R**
CV O-Land 1	**Series 20 3 Roll Carry 152 Plain Inline**	**900**	**152**	**27**	**35**	**3**	**946**	**C**
CV O-Land 1	**Vee Return Series 15 2 Roll 127 Dia**	**900**	**127**	**27**	**10**	**2**	**262**	**R**
CV102	**Series 35 3 Roll Carry 152 Plain Inline**	**1,200**	**152**	**30**	**35**	**3**	**1,212**	**C**
CV102	**Vee Return Series 20 2 Roll 152 Dia**	**1,200**	**152**	**27**	**10**	**2**	**601**	**R**
CV102	**Series 20 3 Roll Carry 152 Plain Inline**	**900**	**152**	**27**	**35**	**3**	**21**	**C**
CV102	**Vee Return Series 15 2 Roll 127 Dia**	**900**	**127**	**27**	**10**	**2**	**8**	**R**

Conveyor Equipment Schedule

Helix Technologies Pty Ltd

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Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Equipment Schedule - Pulleys

Conveyor Number	Description	Pulley Dia mm	Face Width mm	Shaft Length mm	Brg Centres mm	Shaft Dia mm	Brg Dia mm	Lag-ging mm	Wrap Angle deg	T1 kN	T2 kN	R kN
CV 01	Tail	400	850	1,590	1,270	100	90	12	180	10.72	10.78	21.44
CV 01	Drive	500	850	1,640	1,270	120	110	12	210	22.1	10.47	31.56
CV 01	Snub	273	850	1,490	1,270	60	60	12	20	11.02	11.08	3.83
CV 01	Bend	400	850	1,550	1,270	90	80	12	90	10.77	10.83	15.25
CV 01	Takeup	400	850	1,590	1,270	100	90	12	180	10.34	10.39	20.67
CV 01	Bend	400	850	1,550	1,270	90	80	12	90	10.87	10.93	15.37
FDR 03	Takeup	400	1,150	1,950	1,570	160	140	12	180	33.3	33.57	66.88
FDR 03	Drive	500	1,150	1,950	1,570	160	140	12	180	46.45	32.81	79.27
CV O-Land 1	Tail	600	1,050	1,950	1,470	170	150	12	180	50.49	50.69	101
CV O-Land 1	Drive	800	1,050	1,970	1,470	180	160	12	180	57.52	43.07	100.41
CV O-Land 1	Bend	273	1,050	1,690	1,470	60	60	12	20	43.66	43.84	15.16
CV O-Land 1	Pulley	600	1,050	1,850	1,470	160	140	12	90	44.37	44.55	62.75
CV O-Land 1	Takeup	600	1,050	1,950	1,470	170	150	12	180	44.22	44.4	88.44
CV O-Land 1	Pulley	600	1,050	1,850	1,470	160	140	12	90	44.69	44.87	63.2
CV102	Tail	1,458	1,350	2,400	1,800	240	200	12	180	84.37	84.92	168.11
CV102	Drive	1,458	1,350	2,800	1,800	500	450	12	180	713.38	202.45	914.65
CV102	Bend	800	1,350	2,180	1,800	160	140	12	20	202.12	203.31	70.21
CV102	Pulley	1,458	1,350	2,440	1,800	260	220	12	90	202.08	203.27	285.79
CV102	Takeup	1,458	1,350	2,460	1,800	300	260	12	180	201.63	202.82	403.27
CV102	Pulley	1,458	1,350	2,440	1,800	260	220	12	90	202.49	203.69	286.38
CV102	Tail	382	1,050	1,790	1,470	100	90	12	180	8.96	9.05	17.93
CV102	Drive	505	1,050	1,790	1,470	100	90	12	175	10.87	8.21	19.01
CV102	Bend	382	1,050	1,750	1,470	90	80	12	160	8.04	8.13	15.9
CV102	Drive	500	1,050	1,890	1,570	100	90	12	180	9.16	7.42	16.58
CV102	Bend	382	1,050	1,690	1,470	60	60	12	20	8.12	8.21	2.84
CV102	Pulley	382	1,050	1,720	1,470	90	75	12	90	8.13	8.22	11.58
CV102	Takeup	382	1,050	1,750	1,470	90	80	12	180	7.9	7.99	15.81
CV102	Pulley	382	1,050	1,720	1,470	90	75	12	90	8.35	8.44	11.82

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
Project No	P902399	Prepared By	Peter Burrow
Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Equipment Schedule - Motors

Conveyor Number	*Drive No*	*No. of Motors*	*Motor Power kW*	*Motor Speed rpm*	*Motor Voltage Volts*	*Frame*
CV 01	**1**	**1**	**45**	**1,475**	**415**	**F225M04**
FDR 03	**1**	**1**	**7.5**	**1,450**	**415**	**4AP132M-4**
CV O-Land 1	**1**	**1**	**90**	**1,480**	**415**	**F280MK04**
CV102	**1**	**1**	**3,000**	**1,488**	**415**	**DUMMY**
CV102	**1**	**1**	**18.5**	**1,460**	**415**	**F180M04**
CV102	**2**	**1**	**11**	**1,455**	**415**	**D160M**

Helix Technologies Pty Ltd

Project	New Nickel Mine	Client	ABC Mining
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Conveyor No.	CV 01	Design Date	18/09/2004

Conveyor Equipment Schedule - Gearboxes

Conveyor Number	Drive No	Gearbox Code	Gearbox Description	Motor Power kW	Motor Speed rpm	Gearbox Size	Ratio 1:	Max Torque Nm
CV 01	1	5.047	Fenner Shaft Mounted	45	1,475	J5	12.72	5,940
FDR 03	1		Rossi Bevel Helical	7.5	1,450	200	127	11,200
CV O-Land 1	1		No Selection	90	1,480		1	0
CV102	1		No Selection	3,000	1,488		1	0
CV102	1	5.047	Fenner Shaft Mounted	18.5	1,460	G5	8.45	2,970
CV102	2		No Selection	11	1,455		1	0