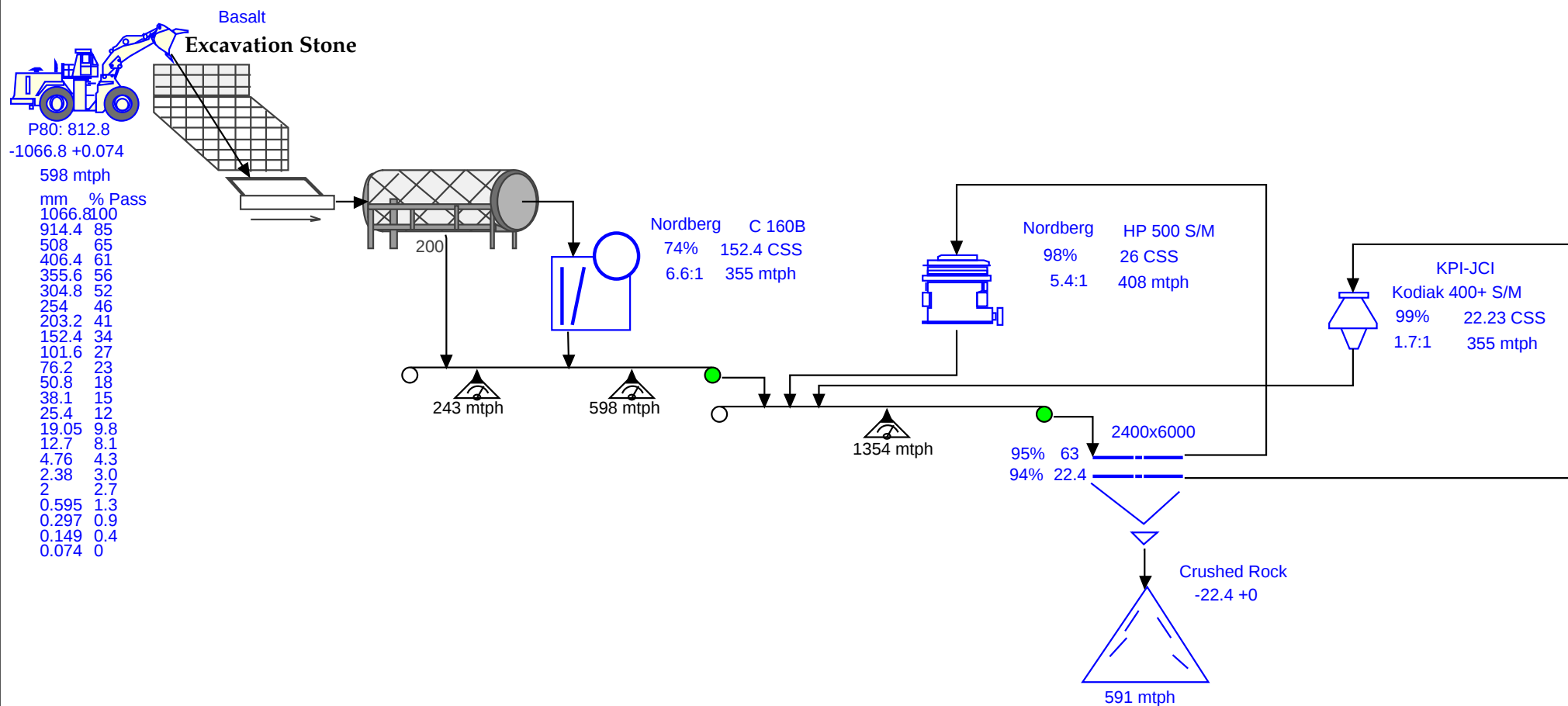


Existing Plant & K400+ Cone Crusher



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All calculations performed by AggFlow. <http://www.AggFlow.com>

Astec Australia

Ausdecom - Excavation Stone

Adam Gordon

Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

Loader

Grading	% Pass	% Ret.	TPH
1066.8	100.0	0	0
914.4	85.0	15.0	89.7
508	65.0	20.0	120
406.4	61.0	4.0	23.9
355.6	56.0	5.0	29.9
304.8	52.0	4.0	23.9
254	46.0	6.0	35.9
203.2	41.0	5.0	29.9
152.4	34.0	7.0	41.9
101.6	26.7	7.3	43.7
76.2	22.5	4.2	25.1
50.8	17.7	4.8	28.7
38.1	14.9	2.8	16.7
25.4	12.0	2.9	17.3
19.05	9.8	2.2	13.2
12.7	8.1	1.7	10.2
4.76	4.3	3.8	22.7
2.38	3.0	1.3	7.8
2	2.7	0.3	1.8
0.595	1.3	1.4	8.4
0.297	0.9	0.4	2.4
0.149	0.4	0.5	3.0
0.074	0.0	0.4	2.4
Total	- -	100.0	598

Solids Rate
 Bulk Density
 Solids Density
 Solids SG
 Water Rate
 Water Density
 Water SG
 Slurry Rate
 Slurry Density
 Slurry SG
 Feed Name

598mtph
 1.6 mt/m^3
 2.65 mt/m^3
 2.65
 0.0 m^3/h
 1.0 mt/m^3
 1.0
 226 m^3/h
 2.65 mt/m^3
 2.65
 Basalt Excavation Stone AFL1

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Adam Gordon

Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

Nordberg C 160B

Grading	% Pass	% Ret.	TPH
228.6	100.0	0	0
203.2	97.0	3.0	10.7
177.8	92.0	5.0	17.8
152.4	85.0	7.0	24.9
127	72.0	13.0	46.2
114.3	62.0	10.0	35.5
101.6	56.0	6.0	21.3
88.9	48.0	8.0	28.4
76.2	38.0	10.0	35.5
63.5	34.0	4.0	14.2
50.8	29.0	5.0	17.8
44.45	26.0	3.0	10.7
38.1	23.0	3.0	10.7
31.75	19.0	4.0	14.2
25.4	17.0	2.0	7.1
19.05	13.0	4.0	14.2
12.7	10.0	3.0	10.7
6.35	6.0	4.0	14.2
0	0.0	6.0	21.3
Total	- -	100.0	355

Closed setting:	152.4 mm
Closed setting range:	127 to 304.8 mm
Red flag rate limit:	481 mtph
Maximum feed:	1074 mm
Reduction Ratio	
Manufacturer Limit(s):	408 to 481 mtph
Feed opening:	1193.8 x 1600.2 mm
Power:	224 kW
Reference:	Nordberg Reference Manual 4th edition

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Astec Australia

Ausdecom - Excavation Stone

Adam Gordon

Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

2 Deck Horizontal Screen Generic

Grading	% Pass	% Ret.	TPH
228.6	100.0	0	0
203.2	99.2	0.8	10.7
200	99.0	0.2	2.2
177.8	96.5	2.5	33.8
152.4	93.2	3.4	45.8
127	88.1	5.0	68.0
114.3	84.7	3.4	46.5
101.6	82.3	2.4	32.2
88.9	79.3	3.0	41.0
76.2	75.7	3.6	48.1
63.5	73.6	2.1	28.6
63	73.5	0.1	1.3
51	71.2	2.3	31.6
50.8	71.2	0.1	0.67
44.45	69.4	1.8	24.4
38.1	67.3	2.1	27.9
38	67.3	0.0	0.67
32	61.5	5.8	78.2
31.75	61.2	0.3	3.9
25.4	53.3	7.9	106
25	52.7	0.6	8.8
22.23	47.4	5.3	72.0
22	46.9	0.5	6.3
19.05	42.1	4.8	64.8
19	42.0	0.1	1.3
16	34.9	7.1	95.9
15.88	34.7	0.3	3.8
13	29.4	5.3	71.3
12.7	29.0	0.4	5.9
10	24.7	4.3	58.1
9.53	23.8	0.9	11.8
8	20.3	3.5	48.1
7.94	20.1	0.1	1.8
6.35	16.9	3.2	43.0
6	16.1	0.8	11.4
4.76	13.0	3.1	42.2
4	11.3	1.7	22.8
3.97	11.2	0.1	1.0
2.38	8.4	2.8	37.8
2	7.3	1.1	14.9
1.19	4.9	2.4	32.6
0.595	2.9	2.1	27.7
0.42	2.3	0.6	7.9
0.297	1.8	0.5	6.6
0.149	1.3	0.5	7.2
0.074	0.9	0.4	5.4
0	0.0	0.9	11.8
Total	--	100.0	1354

	Deck 1	Deck 2
Size	2400x600	2400x600
Cut Size(mm)	63	22.4
Type	mesh	mesh
Calculation method	Cedarapic	Cedarapic
Carry-over method	Near-size	Near-size
Basic Capacity (tph/m^2)	81.72	50.02
Half Size Factor	1.42	0.95
Oversize Factor	1.01	1.05
Deck Factor	1.0	0.9
Efficiency	95	94
Efficiency Factor	0.85	0.88
Wire Type	standard	standard
Open Area %	75.4	67.3
Open Area Factor	1.5	1.35
Slot Type	square	square
Slot Factor	1.0	1.0
Degree of Incline	Horiz-norm	Horiz-norm
Incline Factor	1.2	1.2
Condition	dry/crushed	dry/crushed
Condition Factor	1.0	1.0
Shape	5%	5%
Shape Factor	1.0	1.0
Weight Factor	1.0	1.0
Actual Capacity (tph/m^2)	179.52	63.69
Rate (m/s)	0.3	0.3
DBD Ratio	1.5	3.7
Power:(kW)	0	0
TPH onto Deck	1354	946
TPH off Deck	408	355
TPH through Deck	946	591
Required Area (m^2)	7.54	14.85
Available Area (m^2)	14.9	14.9

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Astec Australia

Ausdecom - Excavation Stone

Adam Gordon

Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

Nordberg HP 500 S/M

Grading	% Pass	% Ret.	TPH
63	100.0	0	0
51	99.7	0.3	1.2
38	97.0	2.7	11.0
32	86.3	10.7	43.6
25	69.3	17.0	69.3
22	59.0	10.3	42.0
19	53.3	5.7	23.3
16	42.7	10.6	43.2
13	33.3	9.4	38.3
10	27.7	5.6	22.8
8	22.3	5.4	22.0
6	18.0	4.3	17.5
4	13.0	5.0	20.4
2	6.7	6.3	25.7
0	0.0	6.7	27.3
Total	- -	100.0	408

Closed setting:	26 mm
Closed setting range:	20 to ? mm
Red flag rate limit:	419 mtpH
Maximum feed:	204 mm
Reduction Ratio	
Manufacturer Limit(s):	419 mtpH
Power:	373 kW
Reference:	Interpolated from:
	Interpolated from:
	Nordberg Reference Brochure
	Nordberg Reference Brochure

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Adam Gordon

Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

KPI-JCI Kodiak 400+ S/M

Grading	% Pass	% Ret.	TPH
44.45	100.0	0	0
38.1	99.0	1.0	3.5
31.75	95.0	4.0	14.2
25.4	87.0	8.0	28.4
22.23	80.0	7.0	24.8
19.05	71.0	9.0	31.9
15.88	58.0	13.0	46.1
12.7	50.0	8.0	28.4
9.53	42.0	8.0	28.4
7.94	35.0	7.0	24.8
6.35	29.0	6.0	21.3
4.76	21.0	8.0	28.4
3.97	18.0	3.0	10.6
2.38	16.0	2.0	7.1
2	14.0	2.0	7.1
1.19	10.0	4.0	14.2
0.595	6.0	4.0	14.2
0.42	5.0	1.0	3.5
0.297	4.0	1.0	3.5
0.149	3.5	0.5	1.8
0.074	3.0	0.5	1.8
0	0.0	3.0	10.6
Total	- -	100.0	355

Closed setting:	22.23 mm
Closed setting range:	12.7 to 50.8 mm
Red flag rate limit:	358 mtph
Maximum feed:	133 mm
Reduction Ratio	
Manufactuer Limit(s):	286 to 358 mtph
Power:	298 kW
Reference:	JCI Brochure

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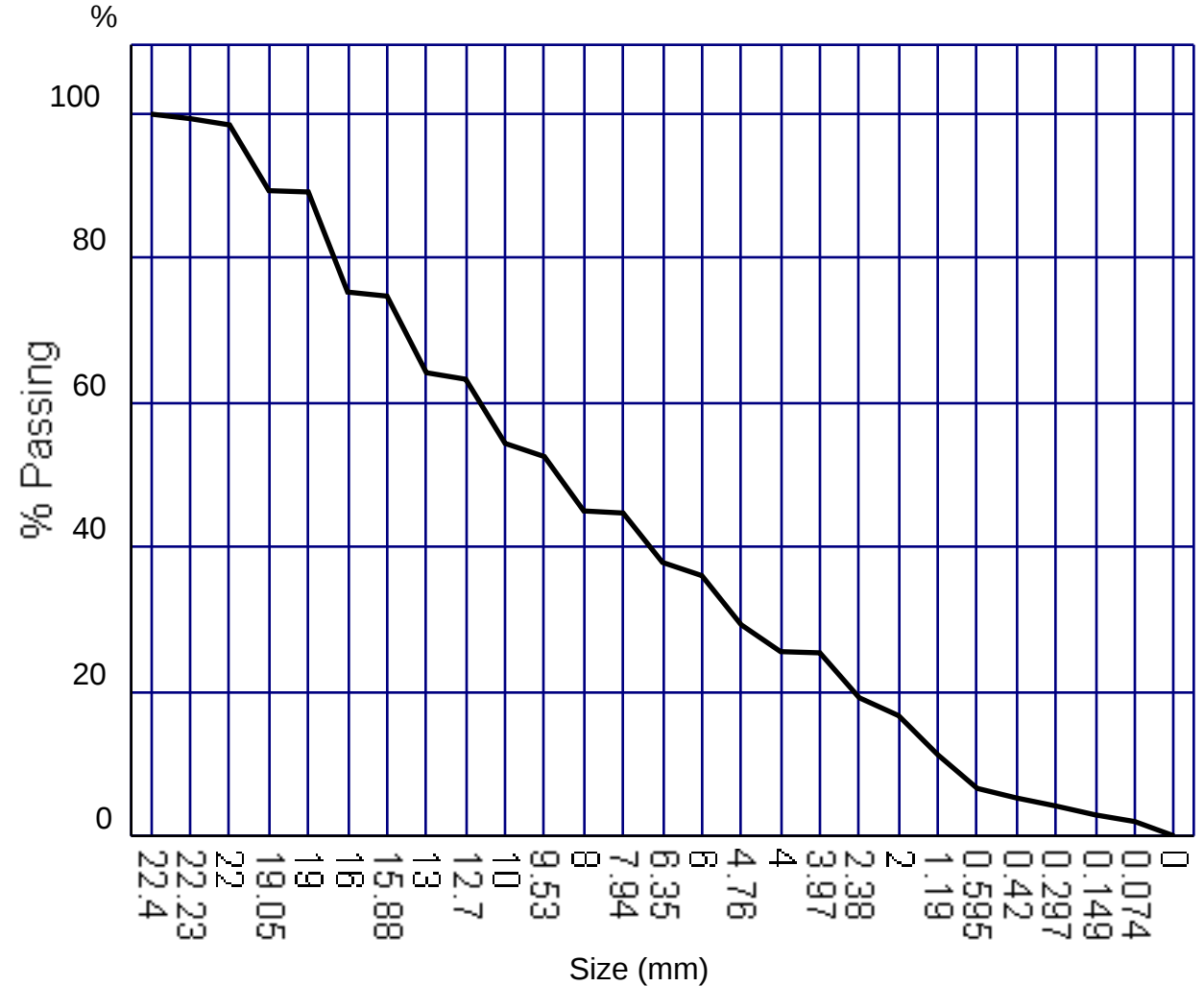
Existing Plant: K400+ Tertiary

Project #: 87439 Revision #: 383055 Date: 25/October/2019

Crushed Rock

Product Pile

Grading	% Pass	% Ret.	TPH
22.4	100.0	0	0
22.23	99.4	0.6	3.7
22	98.5	0.9	5.2
19.05	89.4	9.1	53.8
19	89.2	0.2	1.1
16	75.3	13.9	82.0
15.88	74.8	0.6	3.3
13	64.2	10.6	62.7
12.7	63.3	0.9	5.3
10	54.4	8.9	52.5
9.53	52.6	1.8	10.8
8	45.0	7.5	44.5
7.94	44.7	0.3	1.7
6.35	37.9	6.8	40.4
6	36.1	1.8	10.8
4.76	29.3	6.8	40.2
4	25.5	3.7	22.0
3.97	25.4	0.2	0.99
2.38	19.1	6.2	36.8
2	16.7	2.5	14.7
1.19	11.2	5.4	32.1
0.595	6.6	4.6	27.4
0.42	5.3	1.3	7.8
0.297	4.1	1.1	6.6
0.149	2.9	1.2	7.2
0.074	2.0	0.9	5.4
0	0.0	2.0	11.8
Total	-	100.0	591



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All calculations performed by AggFlow. <http://www.AggFlow.com>

Astec Australia

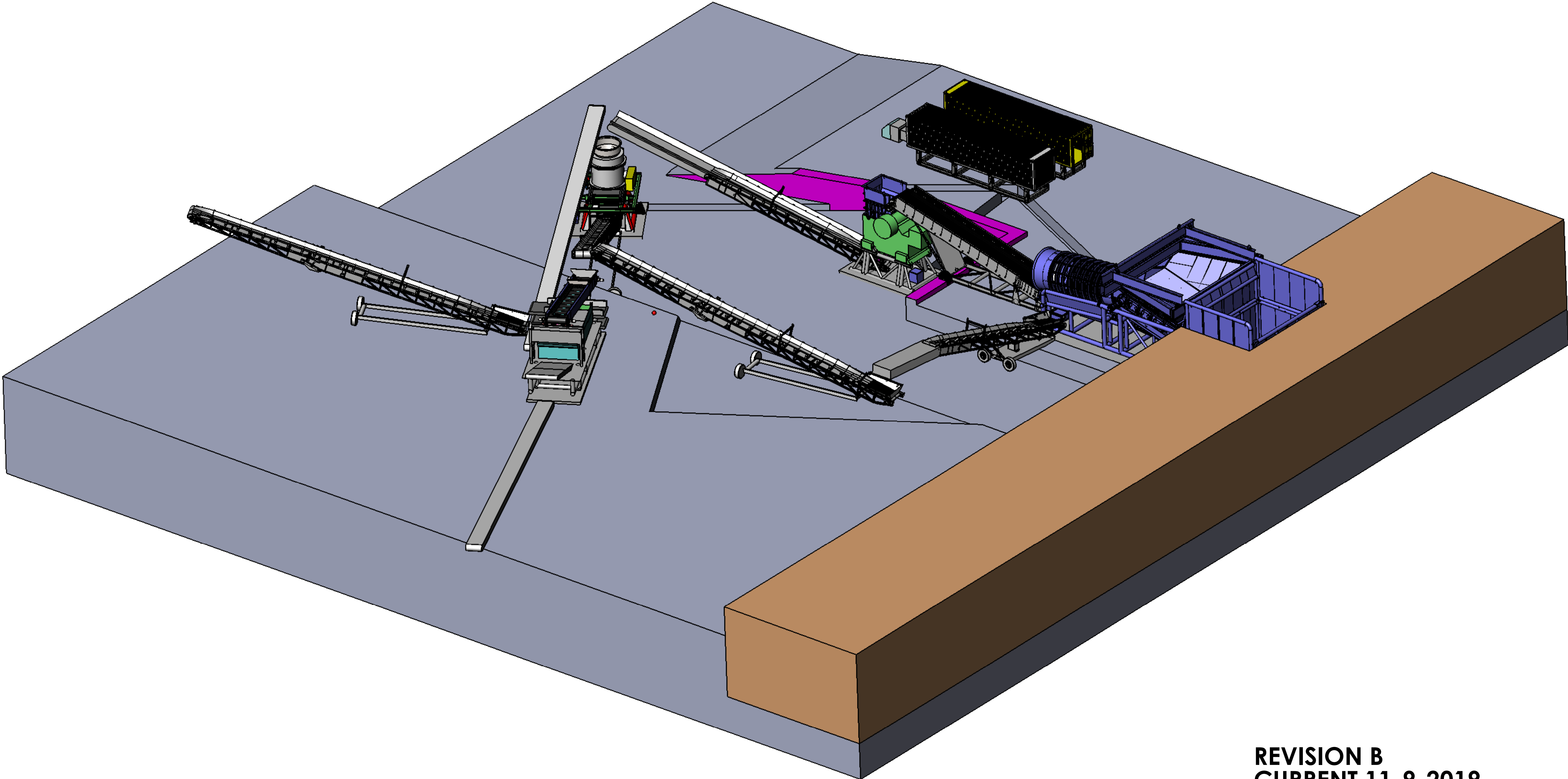
Ausdecom - Excavation Stone

Adam Gordon

Existing Plant: K400+ Tertiary

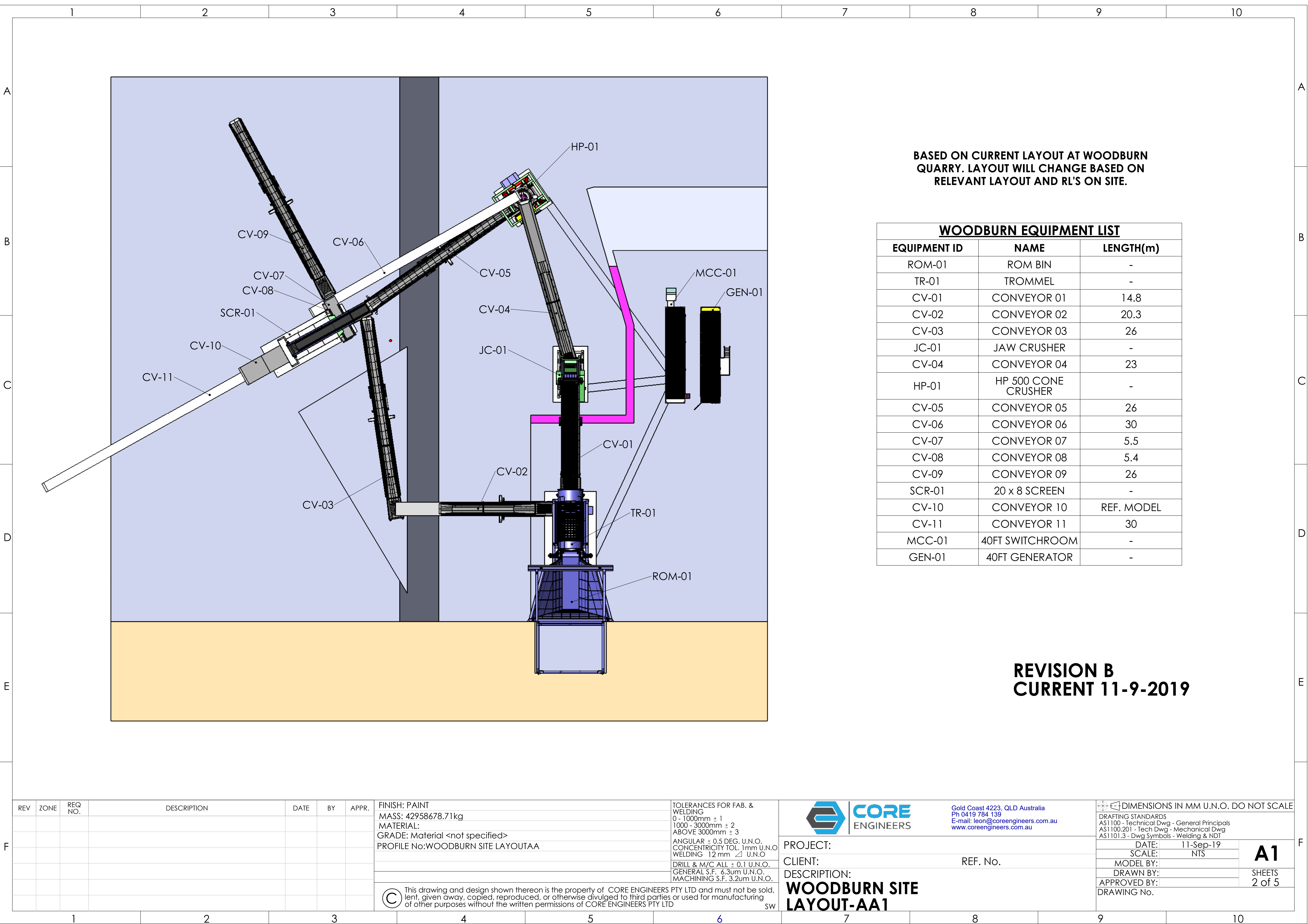
Project #: 87439 Revision #: 383055 Date: 25/October/2019

WOODBURN CURRENT SITE LAYOUT 08/08/19



REVISION B
CURRENT 11-9-2019

REV	ZONE	REQ NO.	DESCRIPTION	DATE	BY	APPR.	FINISH: PAINT MASS: 42958678.71kg MATERIAL: GRADE: Material <not specified> PROFILE No:WOODBURN SITE LAYOUTAA	TOLERANCES FOR FAB. & WELDING 0 - 1000mm ± 1 1000 - 3000mm ± 2 ABOVE 3000mm ± 3 ANGULAR ± 0.5 DEG. U.N.O. CONCENTRICITY TOL. 1mm U.N.O. WELDING 12mm ∠ U.N.O. DRILL & M/C ALL ± 0.1 U.N.O. GENERAL S.F. 6.3um U.N.O. MACHINING S.F. 3.2um U.N.O.	 CORE ENGINEERS Gold Coast 4223, QLD Australia Ph 0419 784 139 E-mail: leon@coreengineers.com.au www.coreengineers.com.au	 DIMENSIONS IN MM U.N.O. DO NOT SCALE																
									PROJECT: CLIENT: DESCRIPTION: WOODBURN SITE LAYOUT-AA1	REF. No.	<table><tr><td>DATE:</td><td>11-Sep-19</td><td rowspan="4">A1</td></tr><tr><td>SCALE:</td><td>NTS</td></tr><tr><td>MODEL BY:</td><td></td></tr><tr><td>DRAWN BY:</td><td></td></tr><tr><td>APPROVED BY:</td><td></td><td>SHEETS 1 of 5</td></tr><tr><td colspan="3">DRAWING No.</td></tr></table>	DATE:	11-Sep-19	A1	SCALE:	NTS	MODEL BY:		DRAWN BY:		APPROVED BY:		SHEETS 1 of 5	DRAWING No.		
DATE:	11-Sep-19	A1																								
SCALE:	NTS																									
MODEL BY:																										
DRAWN BY:																										
APPROVED BY:		SHEETS 1 of 5																								
DRAWING No.																										
			 This drawing and design shown thereon is the property of CORE ENGINEERS PTY LTD and must not be sold, lent, given away, copied, reproduced, or otherwise divulged to third parties or used for manufacturing of other purposes without the written permissions of CORE ENGINEERS PTY LTD					SW																		



BASED ON CURRENT LAYOUT AT WOODBURN QUARRY. LAYOUT WILL CHANGE BASED ON RELEVANT LAYOUT AND RL'S ON SITE.

WOODBURN EQUIPMENT LIST		
EQUIPMENT ID	NAME	LENGTH(m)
ROM-01	ROM BIN	-
TR-01	TROMMEL	-
CV-01	CONVEYOR 01	14.8
CV-02	CONVEYOR 02	20.3
CV-03	CONVEYOR 03	26
JC-01	JAW CRUSHER	-
CV-04	CONVEYOR 04	23
HP-01	HP 500 CONE CRUSHER	-
CV-05	CONVEYOR 05	26
CV-06	CONVEYOR 06	30
CV-07	CONVEYOR 07	5.5
CV-08	CONVEYOR 08	5.4
CV-09	CONVEYOR 09	26
SCR-01	20 x 8 SCREEN	-
CV-10	CONVEYOR 10	REF. MODEL
CV-11	CONVEYOR 11	30
MCC-01	40FT SWITCHROOM	-
GEN-01	40FT GENERATOR	-

REVISION B
CURRENT 11-9-2019

REV	ZONE	REQ NO.	DESCRIPTION	DATE	BY	APPR.	FINISH: PAINT MASS: 42958678.71kg MATERIAL: GRADE: Material <not specified> PROFILE No:WOODBURN SITE LAYOUTAA	TOLERANCES FOR FAB. & WELDING 0 - 1000mm ± 1 1000 - 3000mm ± 2 ABOVE 3000mm ± 3 ANGULAR ± 0.5 DEG. U.N.O. CONCENTRICITY TOL. 1mm U.N.O. WELDING 12mm ∠ U.N.O. DRILL & M/C ALL ± 0.1 U.N.O. GENERAL S.F. 6.3um U.N.O. MACHINING S.F. 3.2um U.N.O.	 CORE ENGINEERS Gold Coast 4223, QLD Australia Ph 0419 784 139 E-mail: leon@coreengineers.com.au www.coreengineers.com.au	DIMENSIONS IN MM U.N.O. DO NOT SCALE DRAFTING STANDARDS AS1100 - Technical Dwg - General Principals AS1100.201 - Tech Dwg - Mechanical Dwg AS1101.3 - Dwg Symbols - Welding & NDT	
										DATE: 11-Sep-19	A1
										SCALE: NTS	
										MODEL BY:	
										DRAWN BY:	
										APPROVED BY:	SHEETS
										DRAWING No.	2 of 5

PROJECT:
CLIENT:
DESCRIPTION:
WOODBURN SITE LAYOUT-AA1

REF. No.

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Trommel Operation & Assembly Procedure

Plant number 3500



**Ausdecom Recycling.
1 Recycling Court,
Laverton,
Victoria 3026**

Introduction

The large capacity trommel was developed by KIS Plant, to improve the productivity achievable through conventional mobile crushing methods; by sorting the raw feed prior to processing a significant portion of raw feed can be diverted to or from crushers.

The structural design has been certified by an independent Mechanical Engineer (RPEQ 6211). The mechanical systems comply with MDG15, and the hydraulic system is compliant to MDG41.

The machine was designed and manufactured in Australia in 2011 and underwent significant improvements in 2015.

A further refurbishment was completed in 2023. At this time the electrical switchboards were replaced along with significant other electrical components to ensure compliance with latest standards AS/NZ3000 and AS/NZ 3007. Hydraulic upgrades and refurbishment were also carried out to ensure continued compliance to MDG41.

The electrical system was designed to meet the requirements of AS/NZS 3000, AS/NZS3007 as this plant is considered a fixed plant as there are no wheels or tracks and is required to be fixed to the ground for its operation.

The Trommel has the capability to process up to 2,000 ton/hour, handle up to 2-ton rocks and sticky fines and is fully automated with PLC control. It is also capable of receiving up to 75-ton dump trucks.

Index**1.0 Safety****page 5**

- 1.1 Hazard Identification
- 1.1. Safety Features
- 1.2. Safety Procedures
 - 1.2.1. Isolation Procedures
 - 1.2.2. Emergency Shutdown
 - 1.2.3. Unbolting or removing a guard.
- 1.3. PPE
- 1.4. Risk Assessment
- 1.5. SWMS for routine tasks

2.0 Assembly & Disassembly**page 17****2.1 Schedule of individual items by identification number****2.2 Lifting advice for individual items in schedule 2.1**

- 2.2.1 Item 1 – L/H Upper spill beam
- 2.2.2 Item 2 – R/H Upper spill beam
- 2.2.3 Item 3 – Front upper spill beam
- 2.2.4 Item 4 – Upper rear ramp tie
- 2.2.5 Item 5 – L/H Upper ramp side
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- 2.2.7 Item 7 – Front upper ramp tie
- 2.2.8 Item 8 – Bump beam
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- 2.2.13 Item 13 – L/H Lower ramp side
- 2.2.14 Item 14 – R/H Lower ramp side
- 2.2.15 Item 15 – Front lower ramp section
- 2.2.16 Item 16 – L/H Upper bin side
- 2.2.17 Item 17 – R/H Upper bin side
- 2.2.18 Item 18 – Rear upper bin section
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- 2.2.20 Item 20 – R/H lower bin side
- 2.2.21 Item 21 – Rear lower bin section

2.0 Lifting advice for items not included in schedule 2.1.

- 2.3.1 Trommel main frame
- 2.3.2 Apron Feeder assembly
- 2.3.3 Trommel Barrel
- 2.3.4 Trommel feed chute
- 2.3.5 Trommel barrel drive assemblies
- 2.3.6 Pack A
- 2.3.7 Pack B
- 2.3.8 Pack C

- 2.3.9 CV3 or 26m x 1200mm conveyor
- 2.3.10 CV2 or 25m x 2100mm conveyor
- 2.3.11 CV1 or 15m x 1800mm conveyor

2.4 Assembly & Disassembly Procedures

- 2.4.1 Prior to commencing set-up
- 2.4.2 Main Frame – Set up and levelling.
- 2.4.3 Apron Feeder – Installation
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- 3.1.1 General Commissioning Procedures
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4.0 Electrical System

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5.0 Hydraulic System.

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- 5.1 Dissipating residual hydraulic pressure from Roller clamp circuit
 - 5.1.1 Method 1
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- 6.1 Location of gauges and controls
- 6.2 Start Up Procedure
- 6.3 Shut Down Procedure
- 6.4 Alarms
- 6.5 Operation of the 2100mm belt tracking system
- 6.6 Remote and Manual Operation

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SWMS

- ⚠ General Maintenance – DCG-SWMS-101
- ⚠ Mobile Crushing and Screening DCG-SWMS 100
- ⚠ Excavator Operation – DCG-SWMS-110
- ⚠ Assembly & Disassembly of Marulan Trommel DCG-SWMS-115

Safe Operating Procedures

- ⚠ Work at Heights – DCG-SOP-054
- ⚠ Plant and Equipment Isolation (LOTO) DCG-SOP-055

Work Instruction

- ⚠ Hazardous Manual Handling – GHSE-WI-010

Contacts for Service

- Overall General Enquiries - Ausdecom, Brent Alford, Mob: 0439 324 811
- Hydraulic Enquiries – Marrison Hydraulics, Chris Marrison 0429 709 707
- Electronic and Electrical – Gordyn Palmer , Craig Cahill, Mob: 0417 379 062

1.0 Safety

1.1 – Hazard Identification

There are hazards associated with this type of equipment which may be present during the following phases of the equipment life cycle.

- A. Operation,
- B. Maintenance,
- C. Disassembly and assembly,
- D. Commissioning and decommissioning,
- E. Transportation.

These hazards include but may not necessarily be limited to,

- ⚠ Dust inhalation resulting in respiratory disease,
- ⚠ Hearing impairment,
- ⚠ Electrocution, Burns (thermal, electrical or friction),
Being struck by flying objects,
- ⚠ Crushing injury between moving parts,
- ⚠ ⚠ Entanglement with moving parts,
- ⚠ High pressure oil injection,
- ⚠ Slips, trips, falls due to the nature of the landscape in a mineral processing operation.
- ⚠ Manual handling injury

The level of risk associated with each of these factors should be assessed and addressed at the site on a case-by-case basis by way of a documented risk assessment prior to entering any phase of the equipment's life cycle.

All personnel should be inducted into the relevant SWMS prior to commencing any relevant activity, refer to the site requirements before commencing any operations.

1.2 – Safety Features

Safety features have been designed into this equipment to lower the level of risk associated with the hazards identified in section 1.1.

These include.

- 1) Guarding of Conveyors compliant to AS1755-2000
- 2) Guarding of Plant compliant to Work Health & Safety Act. 2011
- 3) Emergency Stop switches and pull wires compliant to AS4024.1604
- 4) Safety signage as per AS1318 and AS1319
- 5) Facility to start, run and monitor plant from remote position,
- 6) All field wiring shielded for ingress protection as per AS60529.
- 7) Low voltage access lighting,
- 8) Firefighting equipment,
- 9) Hose burst diffusers for high pressure hydraulic hoses,
- 10) An audible alarm to alert the impending start-up of the plant,
- 11) Administrative measures such as exclusion zones, training, and checklists for critical tasks.

The inspection and testing of the above systems should be incorporated into the daily prestart inspection process, use the Fleet Office App to complete the daily prestart.

Fleet Office App:



Follow the guidelines in the Fleet Office app to log any defectss that are found during the prestart inspection, add photos to help identify the issue.

Any non-compliant safety device or system should result in the machine being immediately isolated until such time as the issue is resolved and the risk is reduced to an acceptable level.

Safety signage has been fitted to the trommel to identify known hazards and advise the best course of action. Ensure that all workers are familiar with the following signs and their meanings.



Warning, No Entry. Parts of this plant may start without warning.



No Entry, A work permit must be provided before entering this area.



No Entry, follow isolation procedure before removing any guards.



Warning, be aware of the potential for falling objects in this area.

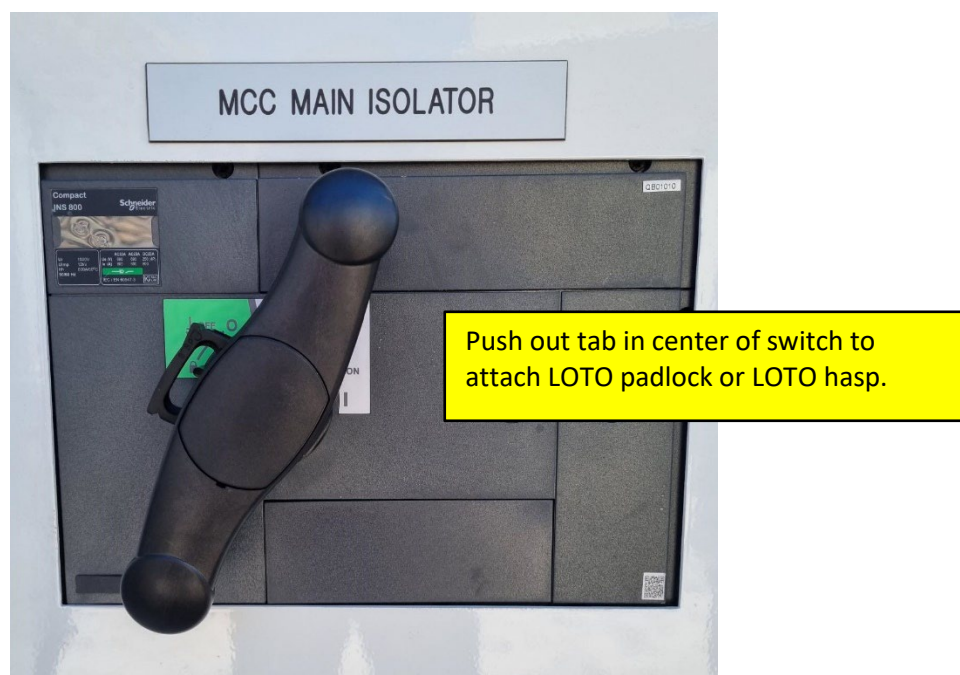
1.3 – Safety Procedures

1.3.1 Isolation Procedures

Before commencing any cleaning, inspection, maintenance, adjustment, or any other activity involving person/s coming into contact with the plant, all potential energy sources shall be isolated and tested for dead by a competent person.

Consult the relevant Safety Management Plan at that site for the correct procedure and necessary documentation.

Refer to section 7 Appendices of this manual for the plant electrical isolation procedure current at the time of preparing this manual.



Main trommel isolation point on electrical cabinet.

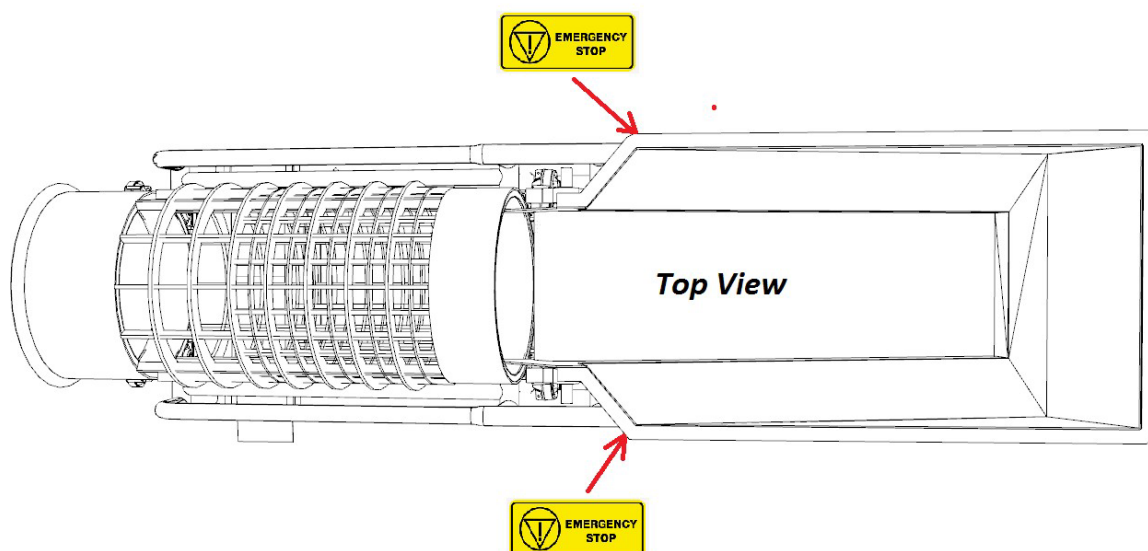
Other Isolation points within Electrical Cabinet to be **Only** used when individual items need isolation for testing purposes.



Appendix: 7, Plant and Equipment Isolation (LOTO) DCG-SOP-055

1.3.2 Emergency Shutdown

Emergency stopping devices have been fitted to the plant in order to comply with AS4024.1604. There are two Emergency Stop switches fitted on the main frame of the plant at the locations shown below.

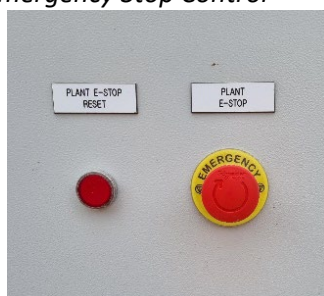


It may become necessary to activate an Emergency Stop device, be it a pull wire (lanyard) or a press button switch. The decision to do so can be made by any person on site if there is potential for harm to personnel, equipment, or the environment.

The emergency stop switches on the main plant are of the same design as the image below.



Emergency Stop Control



Emergency Stop and Reset located on switch board.

Emergency Stops are identified by the following signage in accordance with AS4024.1604 Section 4.4.6 (Symbol IEC 60417-5638).



Emergency stop control and Identification signage.

Once the plant has been successfully stopped and the reason for the stoppage has been addressed in accordance with any relevant statutory regulation, the plant may be re-started after the following steps have been taken.

- Isolate the machine in accordance with section 1.3.1 of this document,
- Conduct a thorough inspection of the plant for damage because of the incident,
- Assess the volume and mass of any material left on conveyors and in the trommel,
- Determine whether the plant will restart without removing any excess material,
- When ready to restart, account for all personnel on site and clear the area,
- Re-energize the power supply and re-set the E-stop switch,
- Start the plant as per section 6.2 *Start-up Procedures*

If a lanyard (pull wire) type Emergency stop has been activated, it will be necessary to reset the switch prior to restarting the plant.



Lanyard (pull wire) type Emergency stop switch.

1.3.3 Unbolting or removing a guard

To comply with the Work Health and Safety Act 2011 all guarding must be by a means that requires the use of a tool to remove it. All guards MUST be bolted closed, and the bolts MUST be tightened beyond "finger tight" by the use of an appropriate tool.

- ⚠ Any unsecured guard or panel constitutes an unguarded, high-risk situation and the plant should be isolated.
- ⚠ All guarding must be returned to its intended location and secured by way of suitable fasteners in accordance with relevant statutory regulation prior to the machine being returned to an operational state.
- ⚠ Before unbolting or effectively removing any guard, **the plant must be isolated** in accordance with section 1.3.1 *Isolation Procedure*. DCG-SOP-055.

Note:

If for the purpose of testing or adjustment, it becomes necessary to approach the plant while it is energised, a documented Risk Assessment must be carried out and a SWMS developed, relevant to the specific activity, taking into consideration the heightened level of risk.

1.4 – Personal Protective Equipment (PPE)

The following PPE must be worn during maintenance activities or while within the immediate vicinity of this equipment in operation.



Eye Protection compliant to AS/NZS1337.1 must be worn at all times while inspecting or maintaining the plant.



Hearing Protection compliant to AS/NZS 1270:2002 must be worn at all times while the plant is in operation.



Safety boots compliant to AS/NZS 2210.1:2010 must be worn at all times while inspecting or maintaining the plant.



A Hard hat compliant to AS/NZS 1801:1997 must be worn at all times while inspecting or maintaining the plant.



High Vis. Apparel compliant to AS/NZS4602.1:2011 must be worn at all times while inspecting or maintaining the plant.

All PPE shall meet the AS/NZS standards and must be of the correct type, must fit the wearer properly, must be in good condition and the wearer must be trained on its use, fitment, and care to ensure maximum protection.

If a higher level of protection is required in accordance with site rules, statutory regulation or because of a site-specific risk assessment, ensure that all personnel comply with the higher level of protection.

1.5 – Risk Assessment

At the time of preparation of this document, in the machine's current configuration, there are no Confined Spaces as determined by the Work Health and Safety (Confined Spaces) Code of Practice 2022.

There are no internal combustion engines on the trommel (Plant number 3500) and therefore no fuel tank, fuel lines or fuel system.

A risk assessment has been developed for use of this plant, as per **IMS Document 20-D1-10**.

Hierarchy of Control 1. Eliminate 2. Substitute 3. Engineering 4. Administration 5. PPE 1= Best practice 5= Last resort Are risks controlled to ALARP As Low As Reasonably Practicable	PROBABILITY	RISK TABLE						Risk Rating: For each identified hazard consider worst credible outcome using the matrix. Risks shall be evaluated on the basis of previous experience and consideration of similar incidents within Ausdecorm or the industry. PROBABILITY (of occurrence) 5. Almost Certain: Common / repeat occurrence 4. Likely: Known to occur 3. Possible: Could occur 2. Unlikely: Not likely to occur 1. Rare: Practically impossible	CONSEQUENCE (injury; environmental; damage) 6. Critical – Multiple Fatalities, serious, long term environmental damage; significant financial loss >70% margin 4. Major – Fatalities, Permanent disability; Life threatening injury; Medium term environmental damage; financial loss 31-70% margin 3. Moderate - Serious Injury/Hospitalisation; Short term environmental effects; financial loss 11-30% margin 2. Minor – First aid; Minor environmental effects; financial loss 1-10% margin 1. Negligible - Minor Injury; minor environmental spill; financial loss <1% margin
		ALMOST CERTAIN	5	MODERATE (5)	HIGH (10)	HIGH (15)	HIGH (20)	EXTREME (30)	
		LIKELY	4	MODERATE (4)	MODERATE (8)	HIGH (12)	HIGH (16)	HIGH (24)	
		POSSIBLE	3	LOW (3)	MODERATE (6)	MODERATE (9)	HIGH (12)	HIGH (18)	
		UNLIKELY	2	LOW (2)	MODERATE (4)	MODERATE (6)	MODERATE (8)	HIGH (12)	
		RARE	1	LOW (1)	LOW (2)	LOW (3)	MODERATE (4)	MODERATE (6)	
				1	2	3	4	6	
		NEGLIGIBLE	MINOR	MODERATE	MAJOR	CRITICAL			
CONSEQUENCE									
ANY IDENTIFIED EXTREME OR HIGH LEVEL RISK SHALL BE TREATED THROUGH ELIMINATION, SUBSTITUTION OR ENGINEERING CONTROLS WHEREVER POSSIBLE PRIOR TO CONSIDERATION OF ADMINISTRATION AND PPE CONTROLS; ALL OTHER RISKS MAY HAVE LOWER CONTROLS ASSIGNED BASED ON THE HIERARCHY OF CONTROLS.									

Reference No	Potential Hazard & Where or how Risk occurs	Risk Assessment Before	Hierarchy of Control	Control Measures					Risk Assessment After	Monitoring & Review Identify person/s responsible to ensure RA & controls are included in SWMS
				Document the control measures to be implemented in accordance with the HIERARCHY of CONTROLS						
				Elimination 1	Substitution 2	Engineering 3	Procedural 4	PPE 5		
1.	Delivery and unloading of plant to / Site									
	Plant to plant / person collision	18	4	Ensure overweight, over dimensioned plant have suitable escorts & permits arranged					6	Supervisor
	Crush injuries when unloading	12	4	Ensure all delivery drivers are competent and correctly certified for the vehicle/s being operated and unloaded					6	Supervisor
		13	3	The delivery driver must ensure UHF radio contact with all plant when delivering to an area where works are being carried out					2	Operator
		18	3	Ensure reversing alarms, flashing lights and horns are in working order and lights are always on when onsite					6	Operator
		20	3	Ensure the unloading area is clear of all non-essential ground personnel					6	Supervisor
		12	3	Ensure delivery vehicle is parked on level secure ground					2	Operator
		12	3	Ensure chocking of tires as required					2	Operator
		18	4	Ensure unloading procedures are adhered to					4	Operator
		12	3	Ensure the plant being unloaded is checked for any damage that may have occurred during transit					6	Operator / Supervisor
		18	3	Driver to obey speed limits & traffic control requirements					6	Operator
2.	Crushing									
	Mobile plant	13	4	Operator must be trained, competent and well supervised					6	Supervisor
	Excavator & Front-end loader	20	3	Certified ROPS / FOPS fitted to machine as required					6	Supervisor
		20	3	Operate machine away from overhanging areas					6	Operator
		18	3	Seat belt must be worn					6	Operator
		18	3	Ensure Park brake is adequate					6	Operator
		13	3	Always Park machine on level ground with bucket lowered to ground					2	Operator
		13	3	Operator to be familiar with all controls					6	Operator
		13	3	Lower all raised equipment when stopped					2	Operator
		18	3	Ensure appropriate mechanical locks are fitted to unit as per operator's manual					2	Operator
		18	3	Ensure all machine guards are fitted prior to operating					2	Operator
		13	3	Ensure reverse alarm is operational					2	Operator
		13	3	Ensure flashing light is operational					2	Operator
		18	3	Keep bystanders clear at all times (exclusions zones)					2	Operator
		18	3	Keep clear of crush zone areas					6	Operator
		18	3	Never short across starter terminals,					2	Operator
		18	3	Never leave machine running unattended					6	Operator
	Stopping / Immobilization	18	3	Stop and immobilize machine as per operator's manual					2	Operator
	Trommel									
	Startup /Shut down	13	3	Trained operator to use PLC to start trommel					2	Operator
	Feeding plant	18	3	Use of mobile plant to feed infeed hopper					2	Operator
	Isolation	18	3	Follow isolation procedure before any maintenance /fault finding commences					3	Operator
3.	Cutting, Stabbing and Puncture									
	Flying Debris	18	4	A hard hat must be always worn when working around the equipment					6	Supervisor
		18	4	Comply with all safety recommendations set out in the operator's manual					6	Supervisor
		20	3	Use appropriate safety equipment e.g. work gloves, eye protection, hearing protection, safety vests					2	Operator
4.	Body Contact									
	Entanglement or striking	18	3	Always keep clear of moving parts and attachments					6	Operator
		18	3	Keep bystanders clear when operating machine					2	Operator
		18	3	Allow only operator on the machine					6	Operator
		20	3	Always start machine from the driver's position					2	Operator
		13	3	Ensure reversing alarm is in proper working condition					2	Operator
		18	3	Ensure all guards are in place prior to operating machine					2	Operator
		13	3	Ensure no loose materials or tools are stored in the cabin					2	Operator
		20	3	Keep clear when engine is operating					2	Operator
		13	4	Approved personnel used for maintenance purposes					6	Supervisor
	Slips/Trips/Falls	18	3	Only mount / dismount unit at locations with steps & / or hand holds					6	Operator
		18	3	Ensure steps & hand holds are clean & secure prior to use					2	Operator
		18	3	Maintain a 3-point contact with steps & hand holds facing unit at all times					6	Operator
		20	3	Do not mount or dismount from a moving machine					6	Operator
		20	3	Do not use any controls as handholds when entering or exiting operators' cabin					6	Operator
		20	3	Never jump off the machine					6	Operator
5.	Manual Handling									
	Changing Equipment Parts	18	3	Mechanical aids must be used when removing and replacing heavy items					6	Supervisor / Operator
		13	3	Proper manual handling techniques are required when working with objects of weight					6	Operator
6.	Safety Equipment									
	Non-Functional	13	4	Ensure Fleet office app (for trommel) and additional pre-start paperwork is completed prior to commencing work and the following safety equipment is checked:					6	Supervisor / Operator

Reference No	Potential Hazard & Where or how Risk occurs	Risk Assessment Before	Hierarchy of Control	Control Measures					Risk Assessment After	Monitoring & Review Identify person/s responsible to ensure RA & controls are included in SWMS
				Document the control measures to be implemented in accordance with the						
				HIERARCHY of CONTROLS						
				Elimination 1	Substitution 2	Engineering 3	Procedural 4	PPE 5		
				Amber beacon, reversing alarm, lights, horn, mirrors, wipers / washers						
7.	Pressure									
	Uncontrolled Discharge	18	3	Hot fluids and high pressure may exist in hoses fitted to machine; caution must be observed					6	Operator
		18	3	Ensure all hydraulic / coolant / air hoses & hydraulic fittings are in good working condition.					6	Operator
		18	3	Relieve pressure prior to any repair					6	Operator
		18	3	Ensure that all raised equipment is lowered before removing any hydraulic lines or pipework etc.					6	Operator
8.	Noise									
	Noise Levels	20	4	Check the noise exposure at the operator's position using a calibrated noise dose meter. The equivalent continuous sound level (Leq) shall not exceed 85 dBA for an 8-hour period. Note: Where the Leq exceeds 85 dBA the following checks shall be made: ✓ Check and rectify that all noise attenuation treatments are in place and in working order. ✓ If unsure of the required treatment check with the OEM (original equipment manufacturer). ✓ Check and rectify engine idle and governed speeds. ✓ Check and rectify any excessive noise source.					2	Supervisor
		18	4	Noise levels are to be checked annually					2	Supervisor
		18	3	Retest the machine noise levels following rectification works					2	Supervisor
		18	4	Where the Leq exceeds 85 dBA hearing protection decals should be displayed on the machine					6	Supervisor
		18	5	Operator shall wear hearing protection when operating the machine					6	Operator
		18	3	Ensure the exhaust system is properly maintained					6	Operator
9.	Explosion									
	Batteries	15	3	Caution must be taken to avoid arcing when checking batteries or jump-starting machines to reduce the risk of fire & explosion					2	Supervisor
	Fire	18	3	Extinguish all ignition sources. Failure to follow this may result in a fire / explosion.					7	Supervisor
		13	3	Stop engine prior to refueling					6	Supervisor
		13	3	Always wipe away spilt fuel before starting					6	Supervisor
		13	3	Ensure fuel cap is screwed on correctly					6	Operator
		13	3	Ensure fire extinguishers are available in plant					6	Operator
10.	Injuries to personnel or damage to plant due to lack of maintenance									
		13	4	All repairs are to be carried out by a qualified tradesperson in accordance with the manufacturer's maintenance manuals					6	Supervisor
		13	4	Ensure completion of Fleet Office app and Daily Plant Checklist each shift prior to use of machine					6	Supervisor
		13	3	Ensure visual inspection during operation to identify any leaks or damage					6	Operator
		13	4	Ensure development of SWMS					6	Operator
		19	3	Ensure plant is isolated prior to commencing maintenance work					2	Supervisor
11.	Injuries to personnel from plant interface onsite									
	Limited visibility may result in injuries	20	3	Ensure the use of a spotter as required					2	Operator
	Plant to person collision	18	3	Ensure delineation and NO-GO zones are established					2	Supervisor
		18	3	Ensure barricading as required					2	Supervisor
		18	3	Ensure all safety equipment on the plant is operational (reversing alarms)					2	Operator

1.6 – SWMS for Routine Tasks

Various Safe Work Method Statements (SWMS) have been developed for routine maintenance activities to minimise the potential for a known hazard to cause harm to personnel, equipment, or the environment. All work performed on this equipment must be done in accordance with a current, relevant SWMS.

These SWMS will require regular review to ensure their relevance to the specific application and proximity to other equipment in the immediate vicinity.

The relevant project management plan shall be reviewed and the highest level of protection for personnel will take precedence.

The following SWMS have been developed for routine tasks involved with each phase of the equipment's life cycle.

- i. General Maintenance – DCG-SWMS-101
- ii. Hazardous Manual Handling – GHSE-WI-010
- iii. Mobile crushing and screening DCG-SWMS 100
- iv. Work at Heights – DCG-SOP-054
- v. Excavator operation – DCG-SWMS-110
- vi. Assembly & Disassembly of Marulan Trommel DCG-SWMS-115
- vii. Plant and Equipment Isolation (LOTO) DCG-SOP-055

Please refer to section 7 "Appendices" of this procedure for the full SWMS

A site-specific SWMS should be developed in conjunction with a documented Risk Assessment, for any task not covered in the above, generic SWMS.

IMPORTANT!

If a SWMS has not been developed for the maintenance activity you intend to undertake, please consider the following in the planning stage of the task.

- ⚠ All personnel conducting any task associated with the Operation, Maintenance, Disassembly & Assembly, Commissioning & Decommissioning and/or transportation of this equipment **MUST** be trained, competent and supervised for the task they are to perform.
- ⚠ Never attempt to adjust, conduct routine maintenance activities, or perform any type of cleaning while the equipment is operational.
- ⚠ Ensure that all energy sources have been de-energised, isolated, and locked out prior to commencing any activity as described above. (Follow the LOTO procedure)
- ⚠ During maintenance, use only the correct tools for the job in accordance with the manufacturer's instructions.
- ⚠ Never attempt to adjust, conduct routine maintenance activities, or perform any type of cleaning on hot components, allow to cool to a safe temperature first.
- ⚠ Any work required on the electrical system **MUST** be performed by a suitably qualified electrician and completed in compliance with relevant statutory requirements in that state or territory.
- ⚠ No person with loose hair, garments or jewelry that may become caught or entangled should be allowed within the vicinity of the plant during operation or maintenance.
- ⚠ No children, pets or unaccompanied and inexperienced personnel shall enter the immediate work area.
- ⚠ The immediate work area should be kept clean and free of trip hazards, spills, unsecured items, and anything with the potential to cause harm.
- ⚠ Consider the mass, shape, and size of any object to be lifted or moved manually, it may be necessary to request assistance with the lift or use a mechanical lifting device.
- ⚠ Any work at heights should be carefully considered and suitable equipment made available to minimise the risk of injury to an acceptable level.
- ⚠ All guards and other safety devices removed or disabled for the purpose of maintenance, adjustment and/or cleaning **MUST** be re-fitted prior to testing, commissioning, or operating this equipment.
- ⚠ Before using a mechanical aid to lift any component of the trommel, review the Lifting advice in section 2 of this document.
- ⚠ Ensure all lifting equipment is safe for use, check the SWL/WLL (Safe Working Load or Working Load Limit) parameters as per the manufacturer's markings.
- ⚠ Consider the use of dust suppression devices and/or PPE to minimise the risk of silicosis and other respiratory conditions.

2.0 Assembly and Disassembly Procedures

2.1 – Schedule of Items by Identification Number and weight

Item No	Description	Weight	Lifting points
1	L/H upper spill beam	1 ton	2
2	R/H upper spill beam	1 ton	2
3	Front upper spill beam	2.4 ton	2
4	Upper rear ramp tie	3.3 ton	2
5	L/H upper ramp side	3.5 ton	2
6	R/H upper ramp side	3.5 ton	2
7	Front upper ramp tie	2.3 ton	2
8	Bump beam	4.8 ton	2
9	L/H lower bin tie	1.2 ton	2
10	R/H lower bin tie	1.2 ton	2
11	Front bin tie	5 ton	2
12	Lower rear ramp tie	3 ton	2
13	L/H Lower ramp side	3.5 ton	2
14	R/H Lower ramp side	3.5 ton	2
15	Front lower ramp section	5.6 ton	2
16	L/H upper bin side	4.7 ton	3
17	R/H upper bin side	4.7 ton	3
18	Rear upper bin section	5.6 ton	4
19	L/H lower bin side	7.1 ton	3
20	R/H lower bin side	7.1 ton	3
21	Rear lower bin section	5.6 ton	4

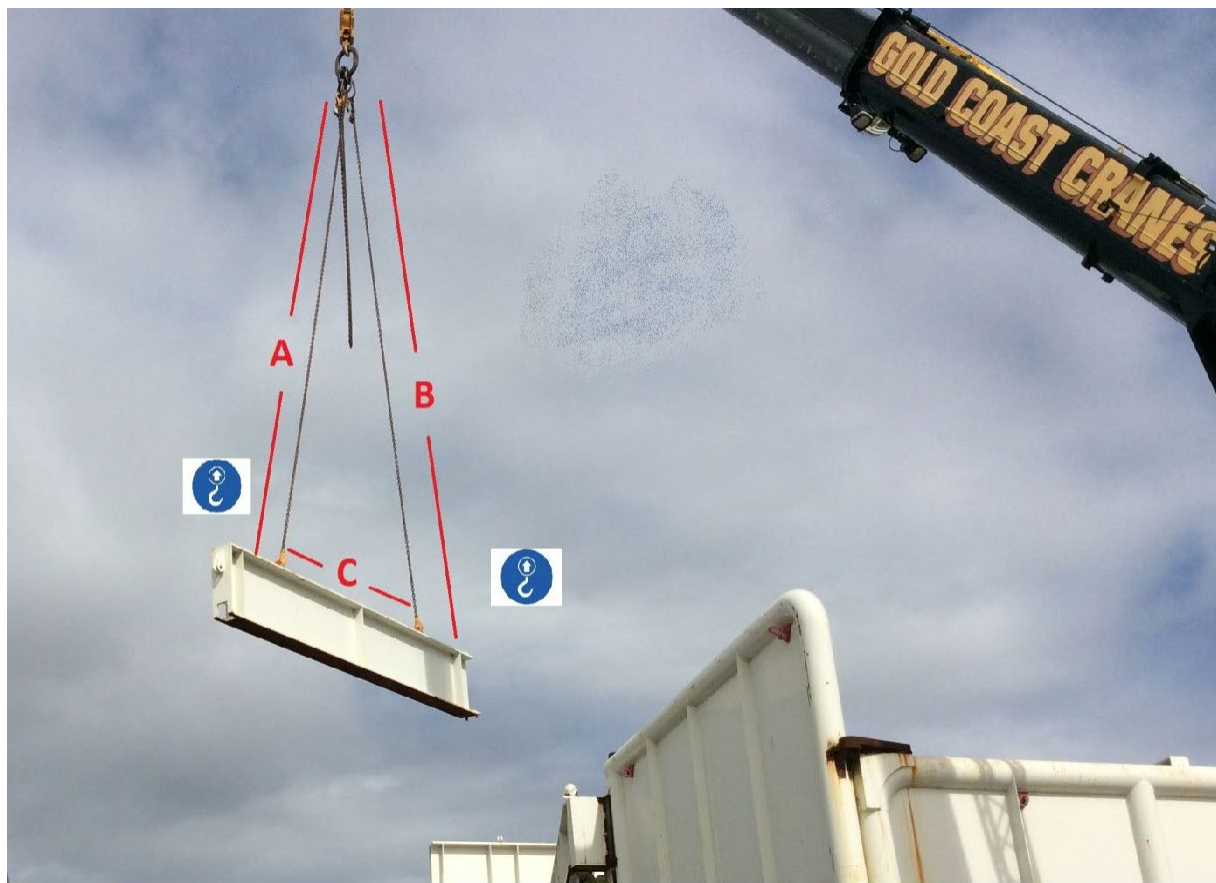
Important Note:

The lifting points are certified to an RPEQ Mechanical Engineering standard and are identified in compliance with mandatory signage criteria.

2.2 – Lifting advice for items in schedule 2.1

The following are photos are the parts listed in the 2.1 schedule, not the assembly sequence, but show the correct lifting points.

2.2.1 Item 1 (L/H Upper Spill Beam)



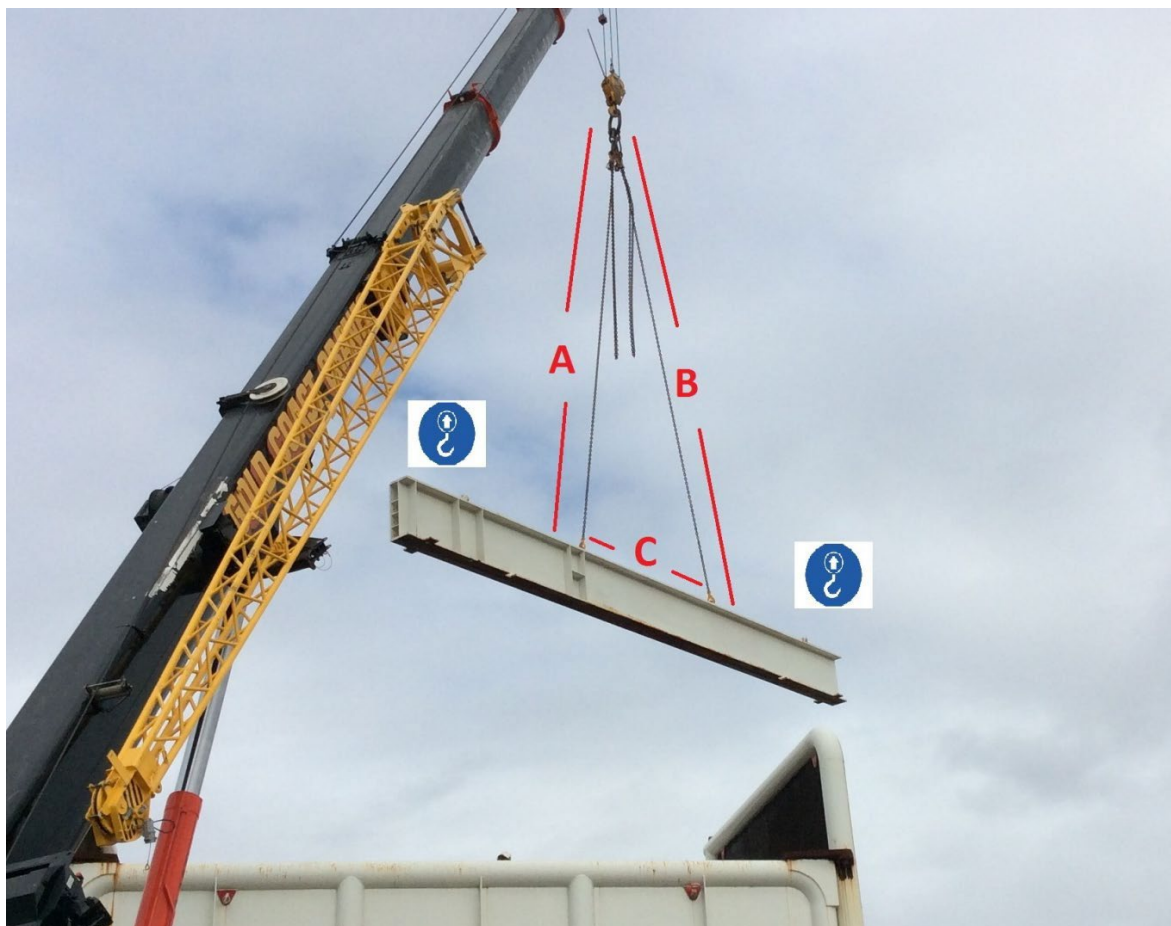
<i>Item 1 – L/H Upper Spill Beam</i>	
Mass	1,000kg
Distance A	8,000 mm
Distance B	8,000 mm
Distance C	3,000mm

2.2.2 Item 2 (R/H upper spill beam)



<i>Item 2 – R/H Upper Spill Beam</i>	
Mass	1,000kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	3,000 mm

2.2.3 Item 3 (Front upper spill beam)



<i>Item 3 – Front Upper Spill Beam</i>	
Mass	2,400 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	3,200 mm

2.2.4 Item 4 (Upper rear ramp tie)



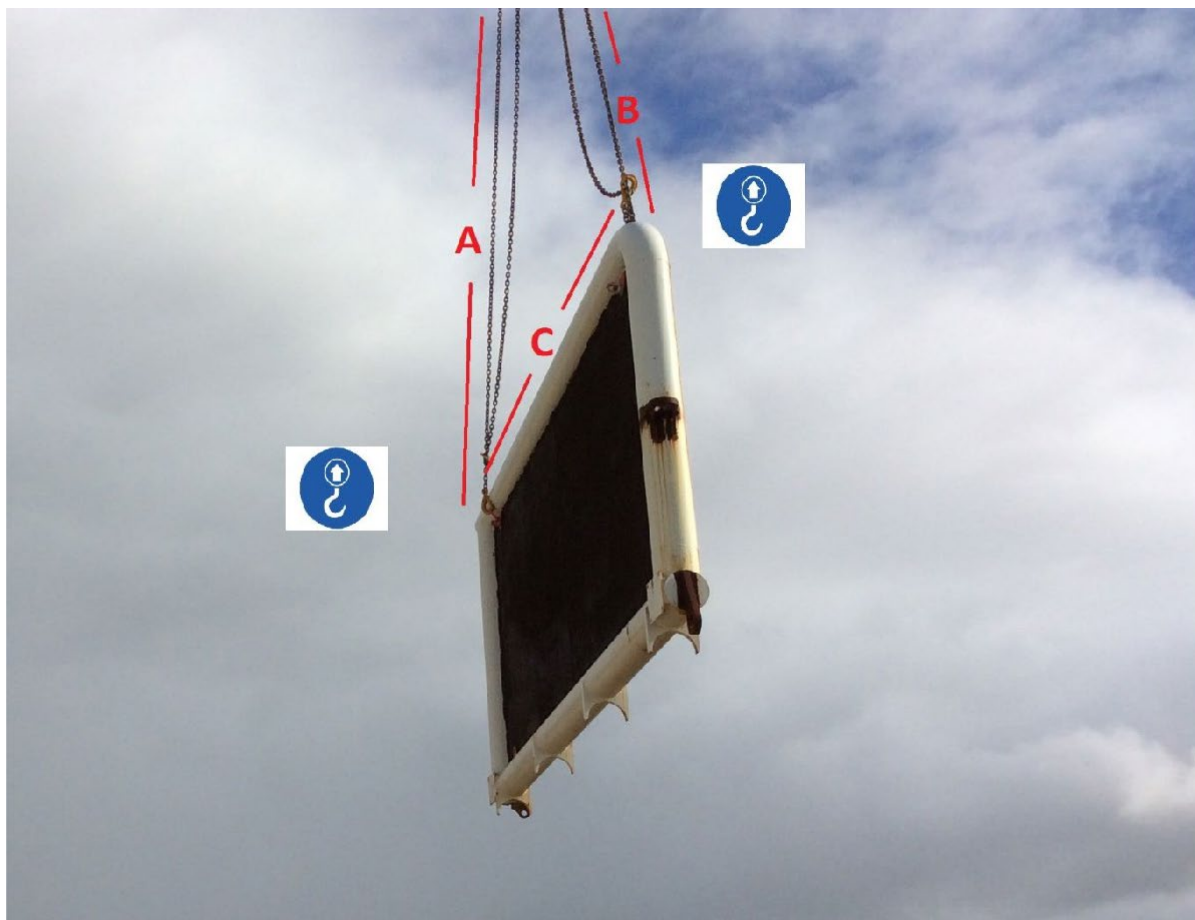
<i>Item 4 – Upper Rear Ramp Tie</i>	
Mass	3,300 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,800 mm

2.2.5 Item 5 (L/H upper ramp side)



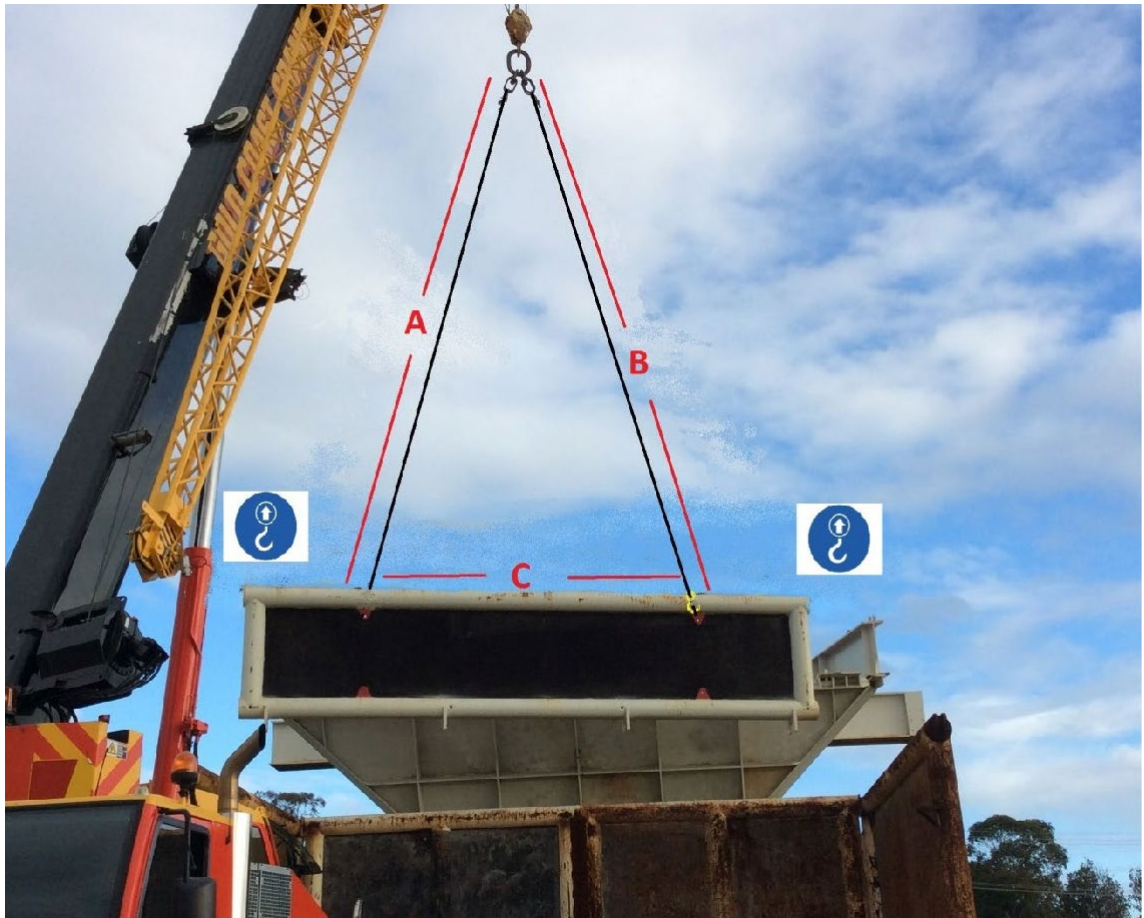
<i>Item 5 – L/H Upper Ramp Side</i>	
Mass	3,500 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,400 mm

2.2.6 Item 6 (R/H upper ramp side)



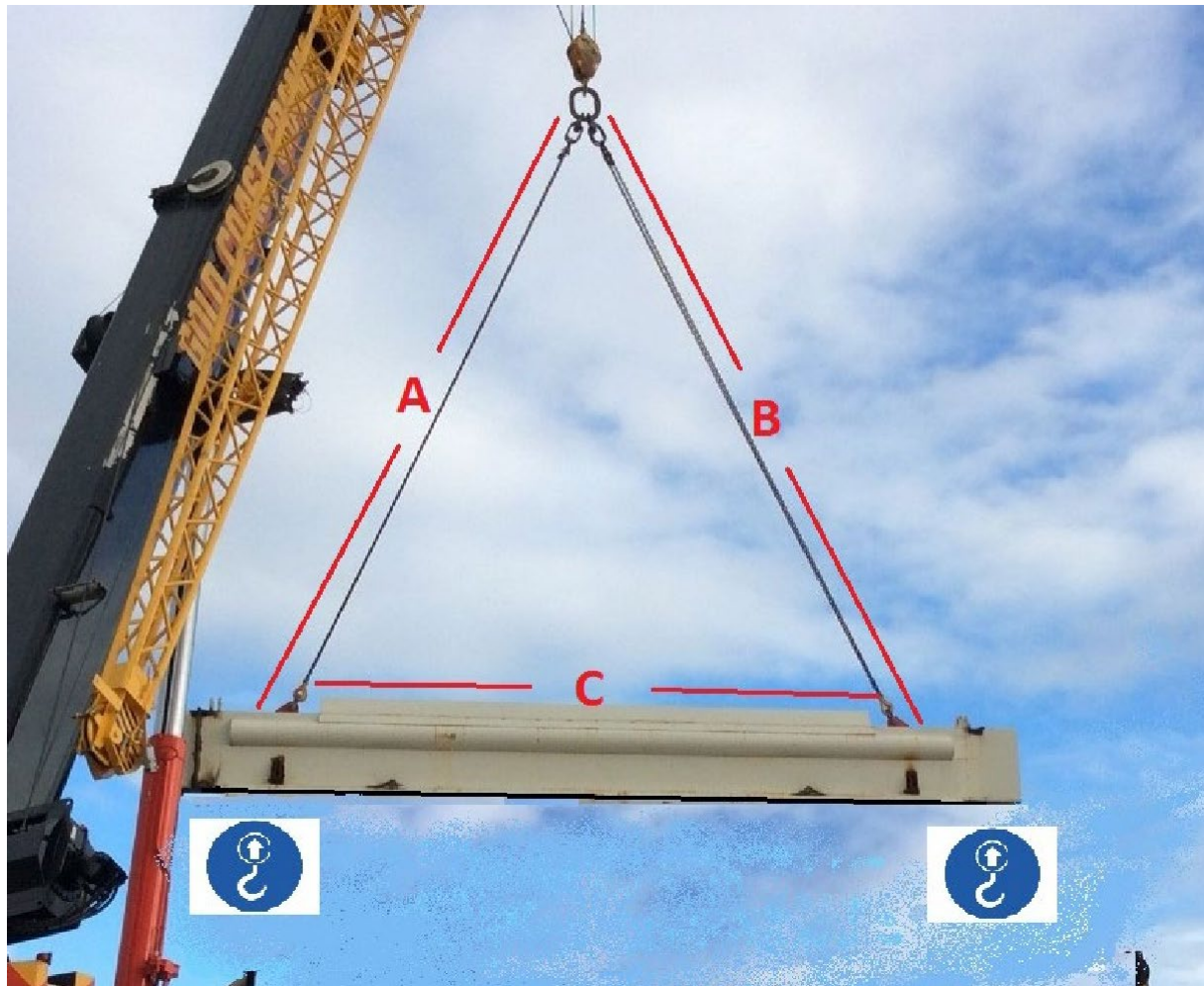
<i>Item 6 – R/H Upper Ramp Side</i>	
Mass	3,500 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,440 mm

2.2.7 Item 7 (Front Upper Ramp Tie)



<i>Item 7 – Front Upper Ramp Tie</i>	
Mass	2,300 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,600 mm

2.2.8 Item 8 (Bump Beam)



Item 8 – Bump Beam	
Mass	4,800 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	6,600 mm

2.2.9 Item 9 (L/H Lower Bin Tie)



<i>Item 9 – L/H Lower Bin Tie</i>	
Mass	1,200 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	3,100 mm

2.2.10 Item 10 R/H Lower Bin Tie



<i>Item 10 – R/H Lower Bin Tie</i>	
Mass	1,200 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	3,100 mm

2.2.11 Item 11 Front Bin Tie



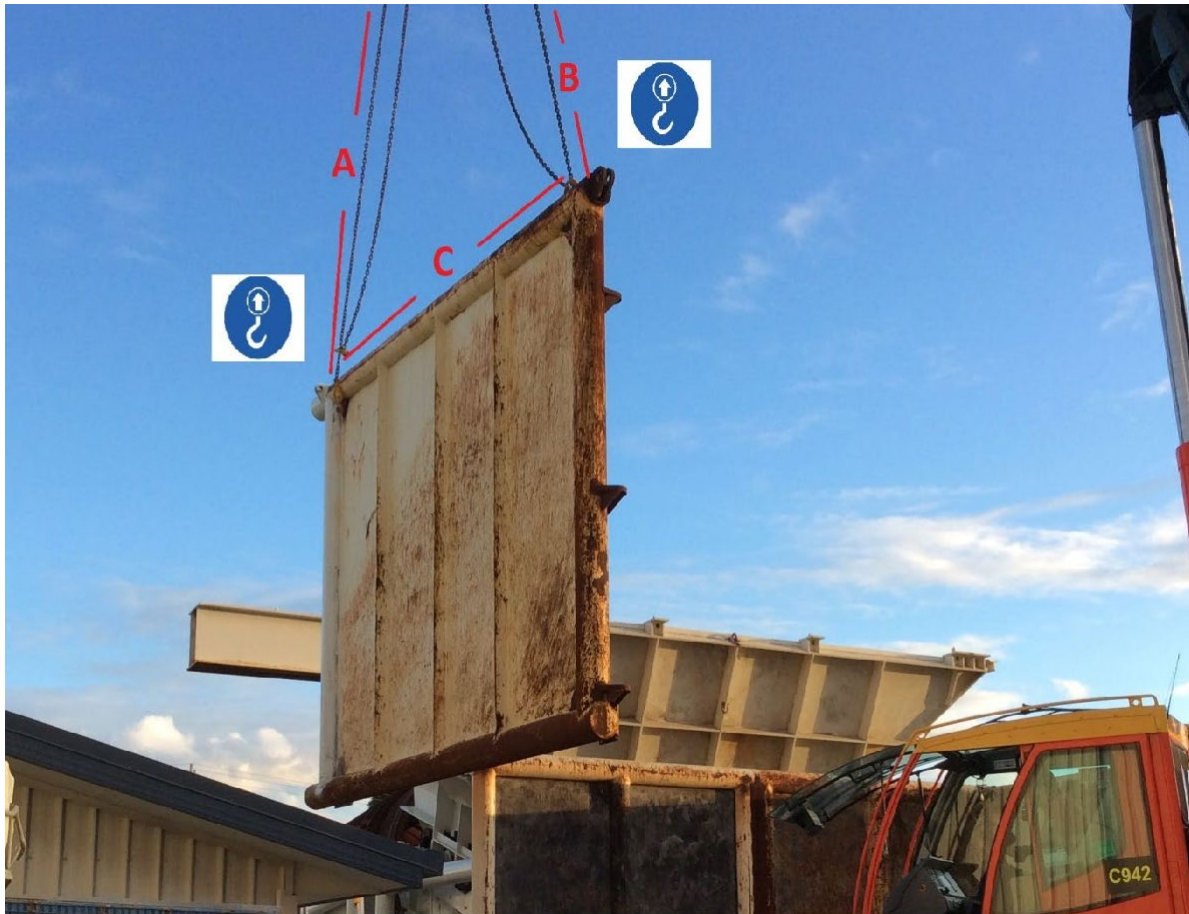
<i>Item 11 – Front Bin Tie</i>	
Mass	5,000 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	3,550 mm

2.2.12 Item 12 - Lower Rear Ramp Tie



<i>Item 12 – Lower rear ramp tie</i>	
Mass	3,000 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,300 mm

2.2.13 Item 13 – L/H Lower Ramp side



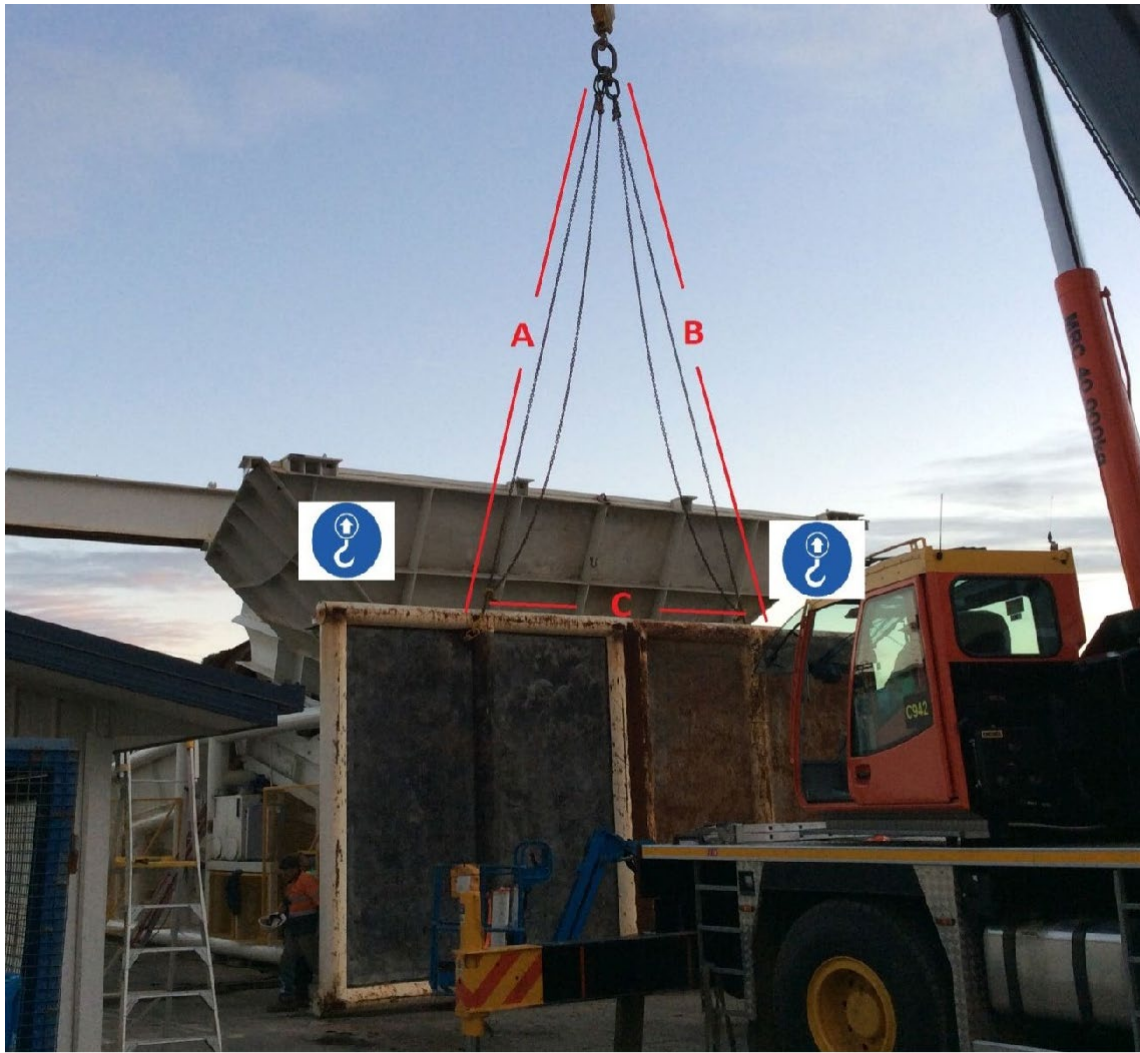
<i>Item 13 – L/H Lower ramp side</i>	
Mass	3,500 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,800 mm

2.2.14 Item 14 – R/H Lower Ramp Side



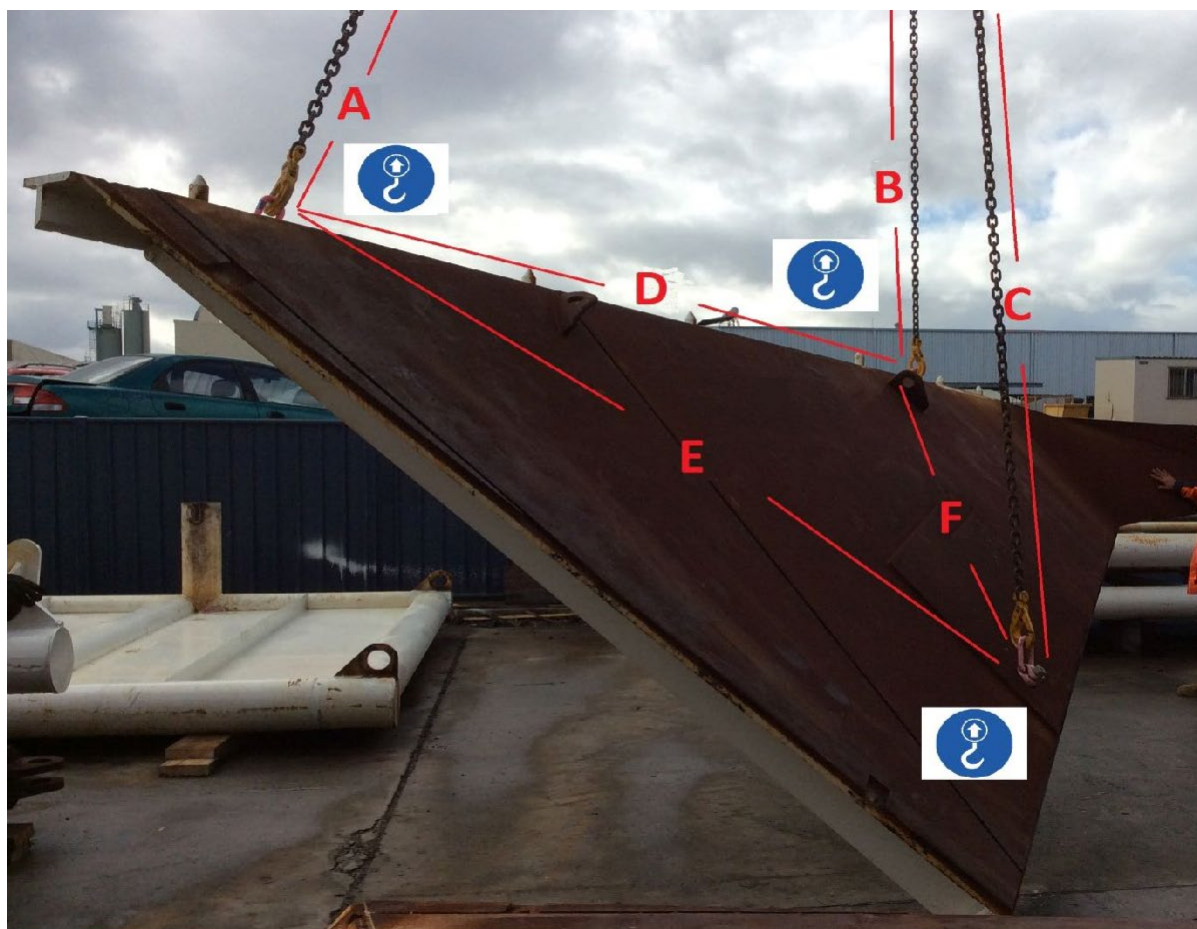
<i>Item 14 – R/H Lower ramp side</i>	
Mass	3,500 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,800 mm

2.2.15 Item 15 – Front lower ramp section



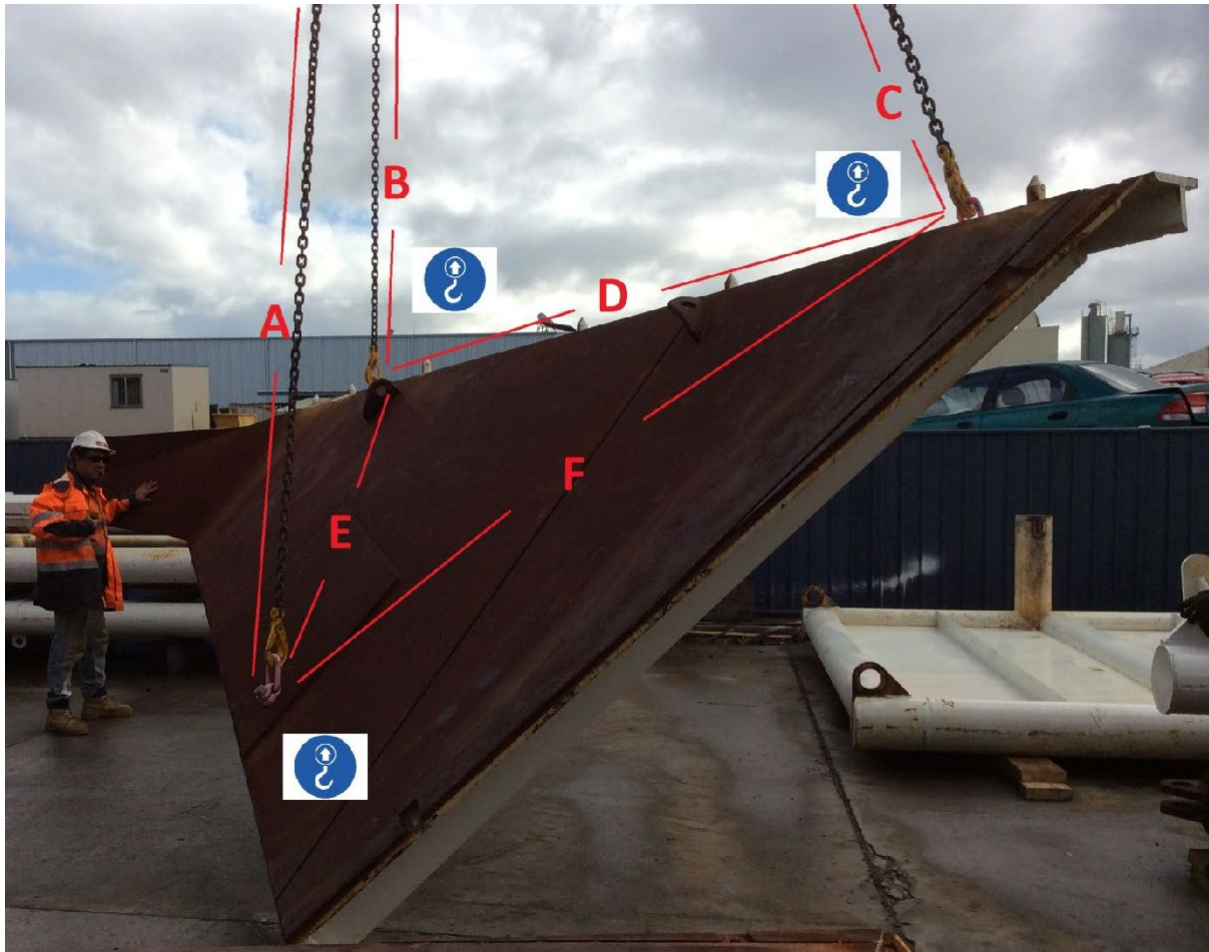
<i>Item 15 – Front lower ramp section</i>	
Mass	3,500 kg
Dimension A	8,000 mm
Dimension B	8,000 mm
Dimension C	4,350 mm

2.2.16 Item 16 – L/H upper bin side



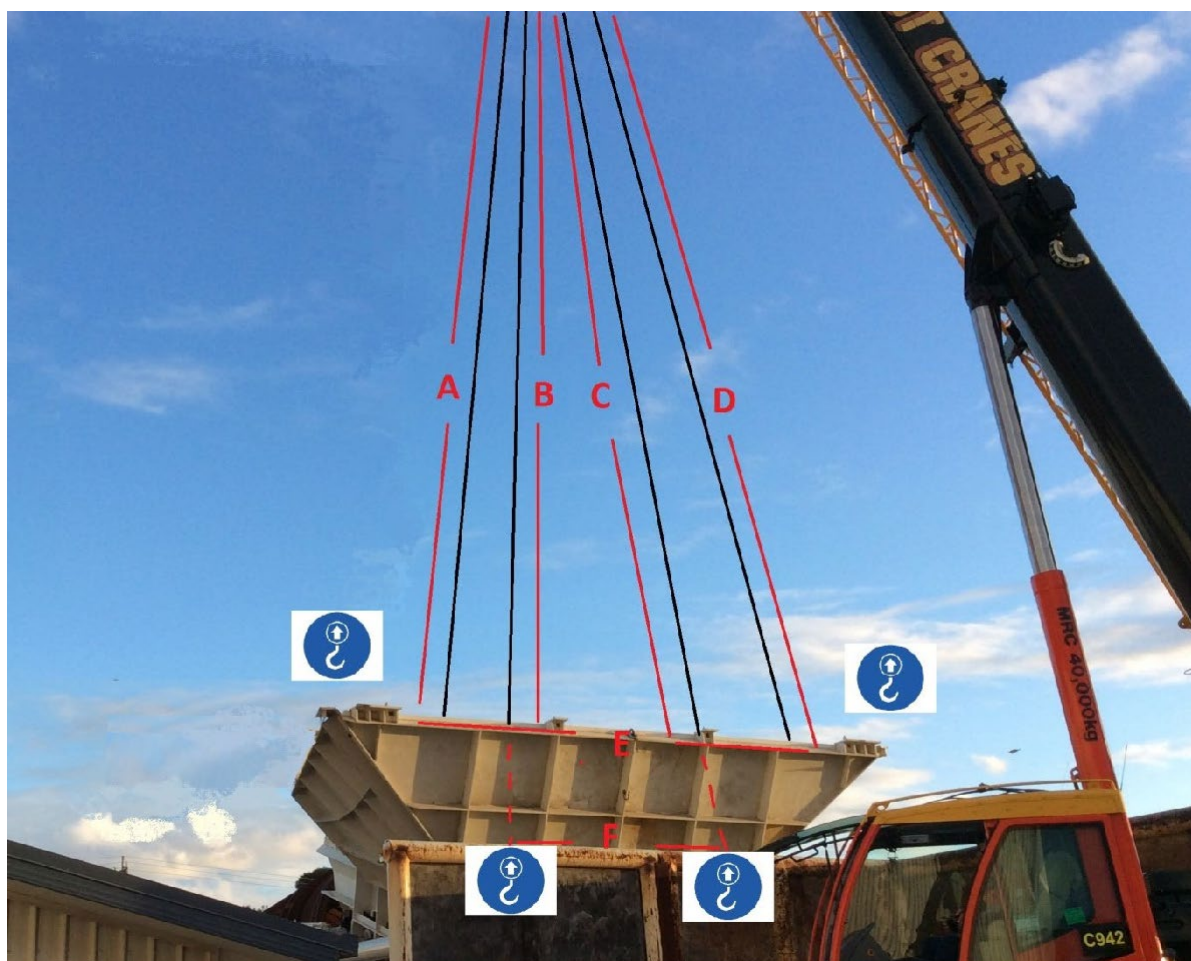
<i>Item 16 – L/H upper bin side</i>	
Mass	4,800 kg
Dimension A	7,320 mm
Dimension B	7,150 mm
Dimension C	8,000 mm
Dimension D	4,500 mm
Dimension E	3,100 mm
Dimension F	3,000 mm

2.2.17 Item 17 – R/H Upper bin side



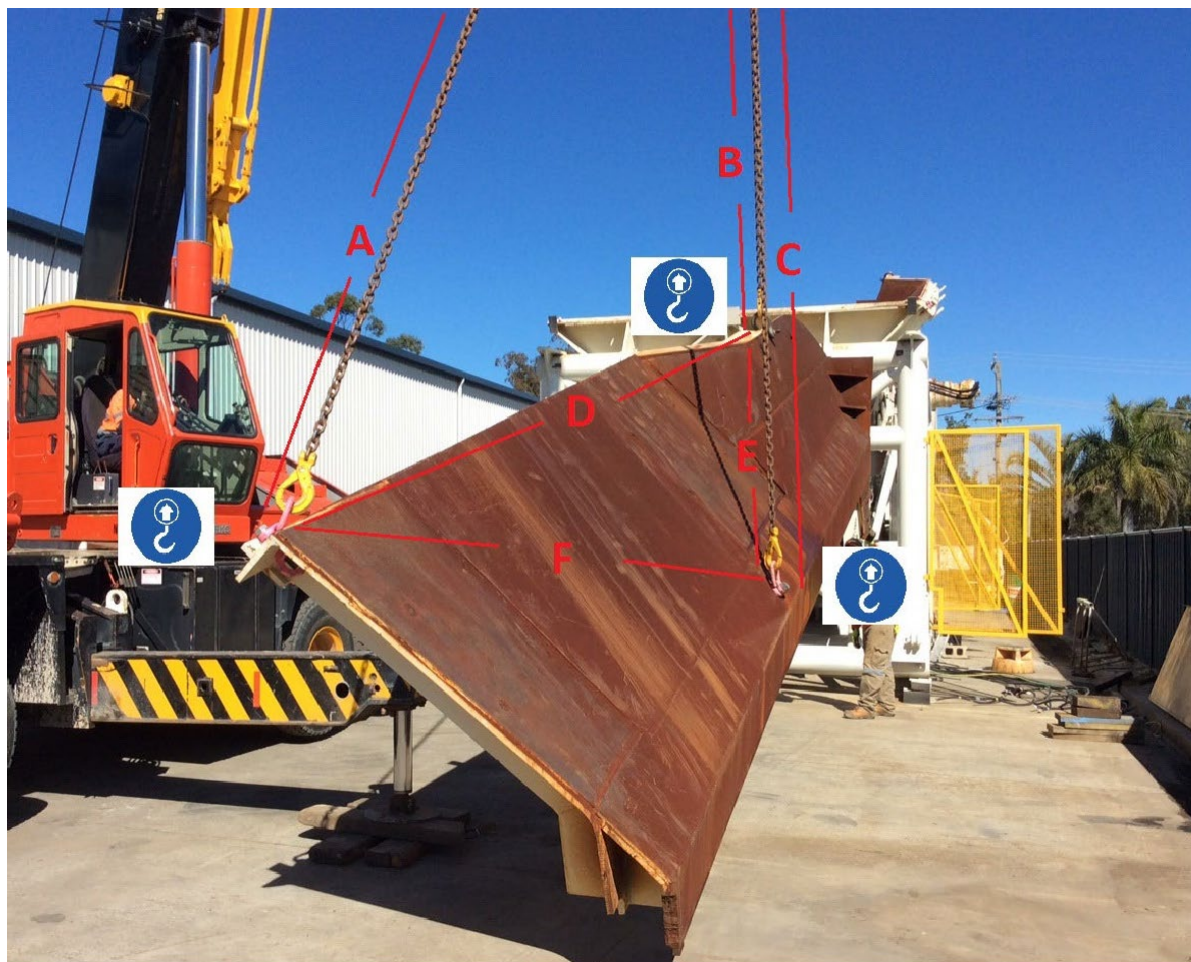
<i>Item 17 – R/H upper bin side</i>	
Mass	4,700 kg
Dimension A	8,000 mm
Dimension B	7,150 mm
Dimension C	7,320 mm
Dimension D	4,500 mm
Dimension E	3,000 mm
Dimension F	3,100 mm

2.2.18 Item 18 – Rear upper bin section



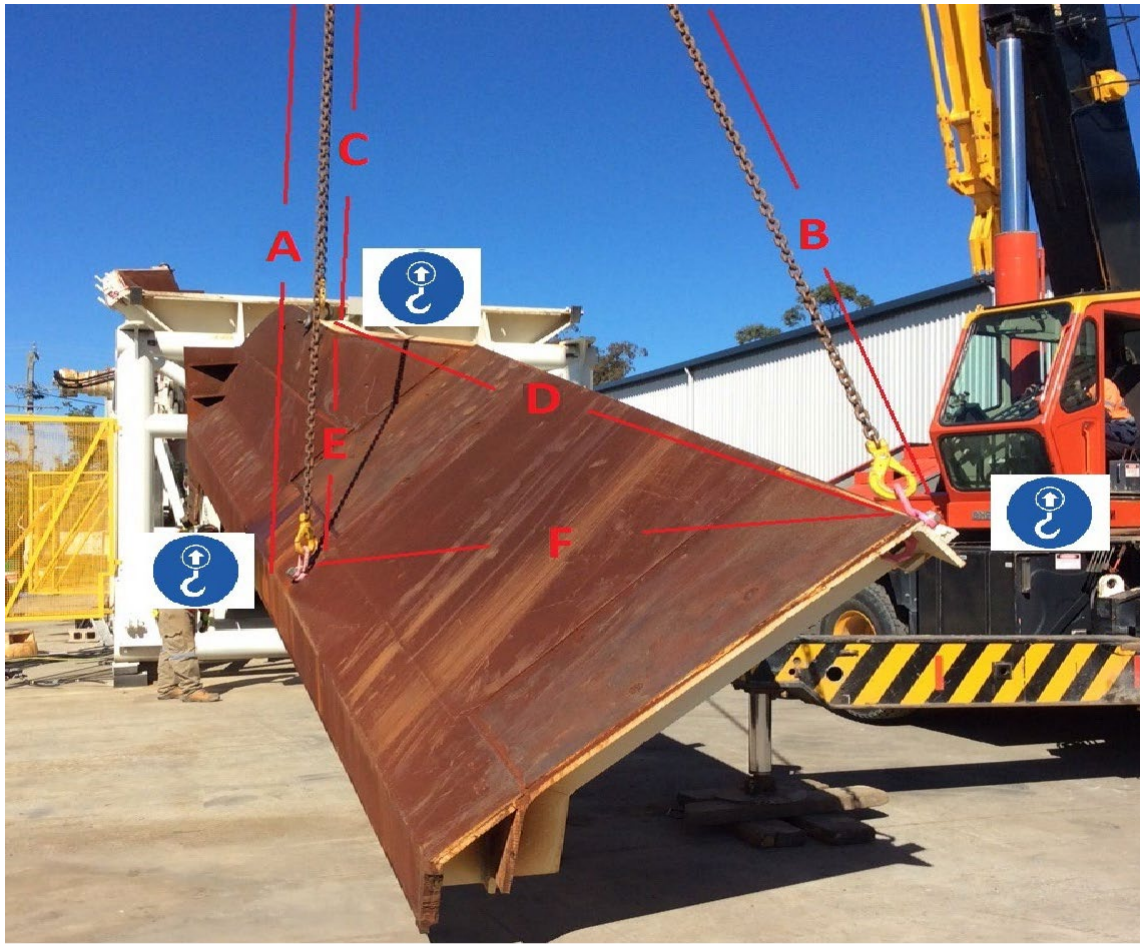
<i>Item 18 – Rear upper bin section</i>	
Mass	5,600 kg
Dimension A	6,200 mm
Dimension B	8,000 mm
Dimension C	8,000 mm
Dimension D	6,200 mm
Dimension E	4,070 mm
Dimension F	5,130 mm

2.2.19 Item 19 – L/H lower bin side



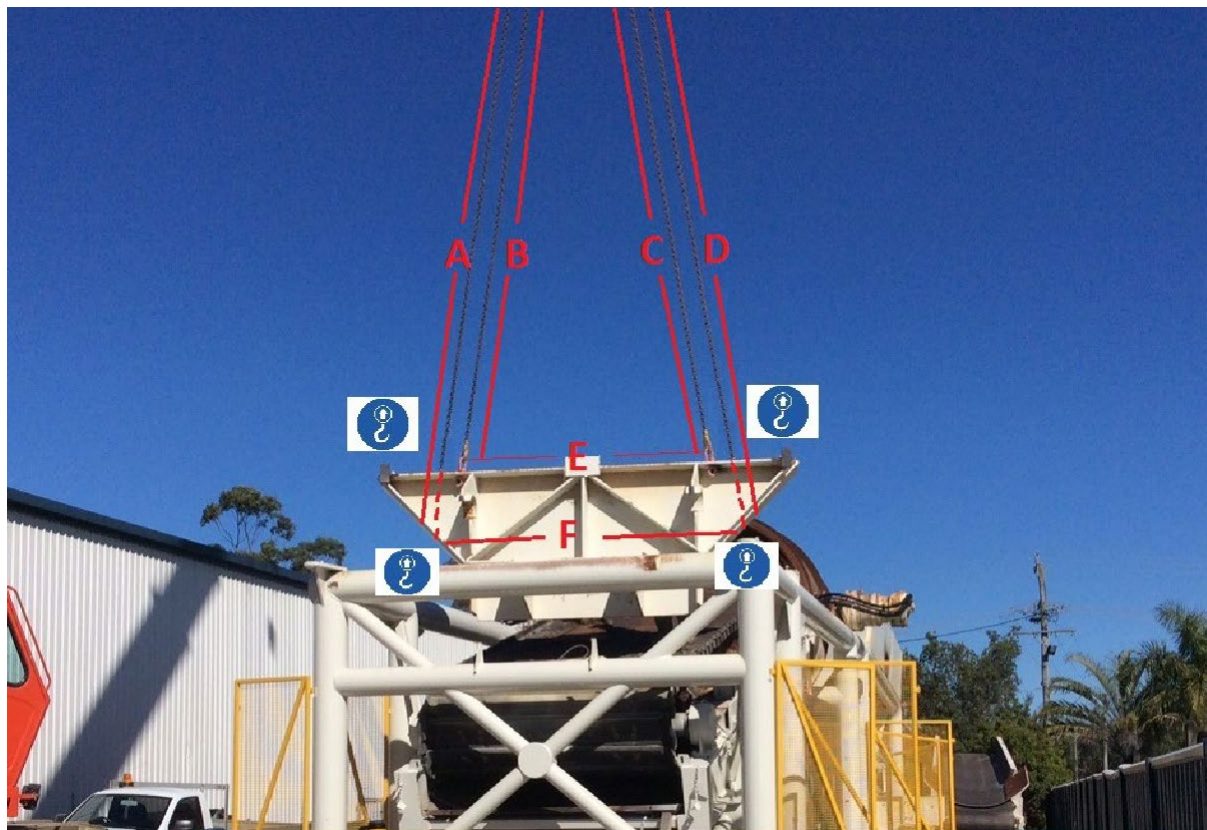
<i>Item 19 – L/H lower bin side</i>	
Mass	7,000 kg
Dimension A	8,000 mm
Dimension B	5,920 mm
Dimension C	7,400 mm
Dimension D	5,900 mm
Dimension E	3,300 mm
Dimension F	3,300 mm

2.2.20 Item 20 – R/H Lower bin side



<i>Item 20 – R/H lower bin side</i>	
Mass	7,100 kg
Dimension A	7,400 mm
Dimension B	8,000 mm
Dimension C	5,920 mm
Dimension D	5,900 mm
Dimension E	3,300 mm
Dimension F	3,300 mm

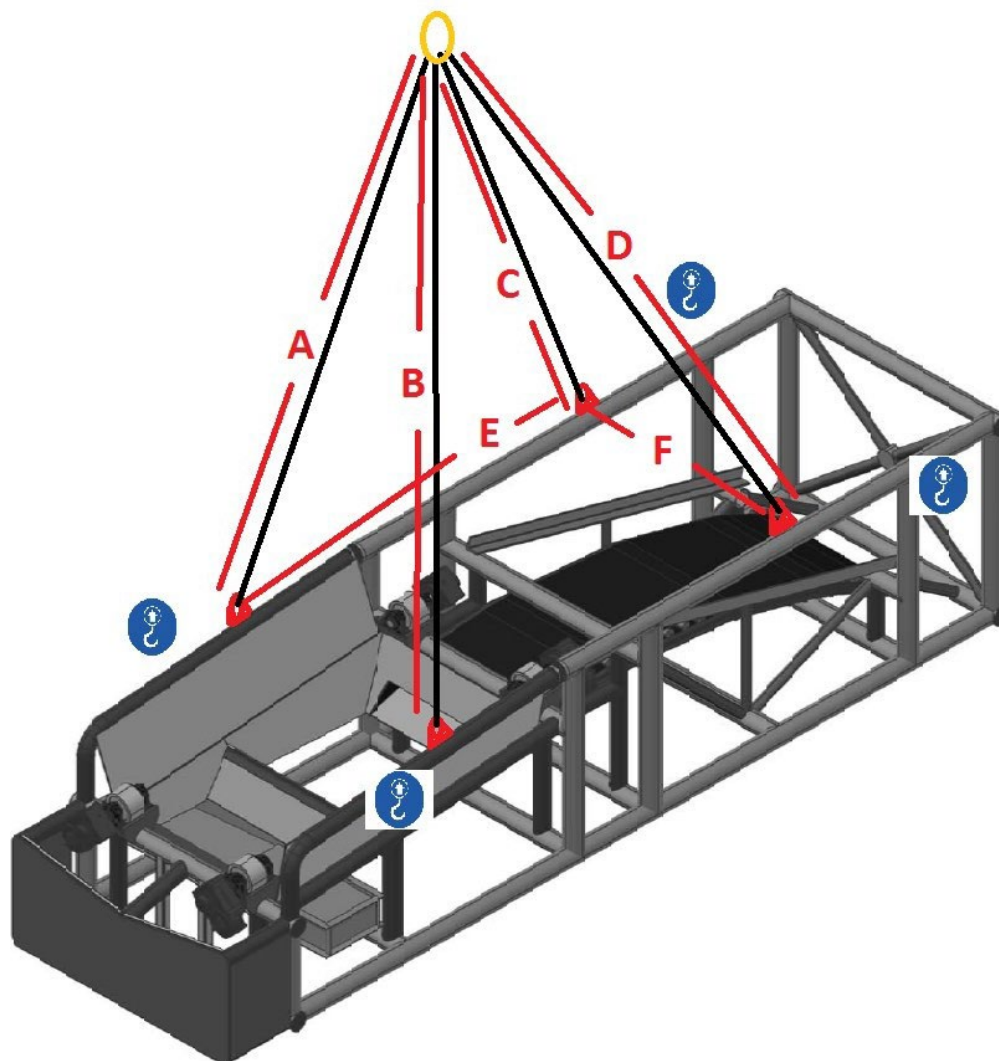
2.2.21 Item 21 – Rear lower bin section



<i>Item 21 – Rear lower bin section</i>	
Mass	5,600 kg
Dimension A	8,000 mm
Dimension B	6,800 mm
Dimension C	6,800 mm
Dimension D	8,000 mm
Dimension E	2,650 mm
Dimension F	3,200 mm

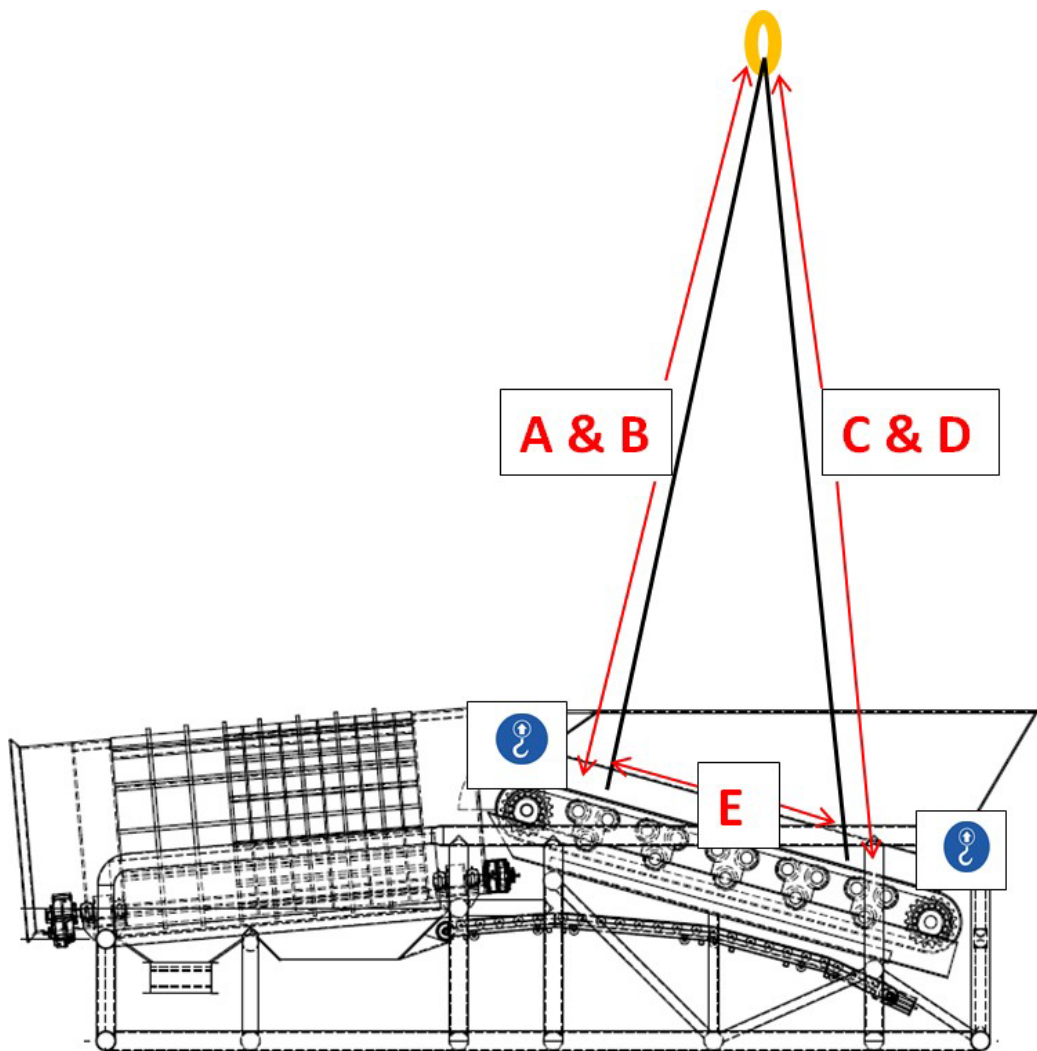
2.3- Lifting advice for items not included in schedule 2.1

2.3.1 - Trommel main frame



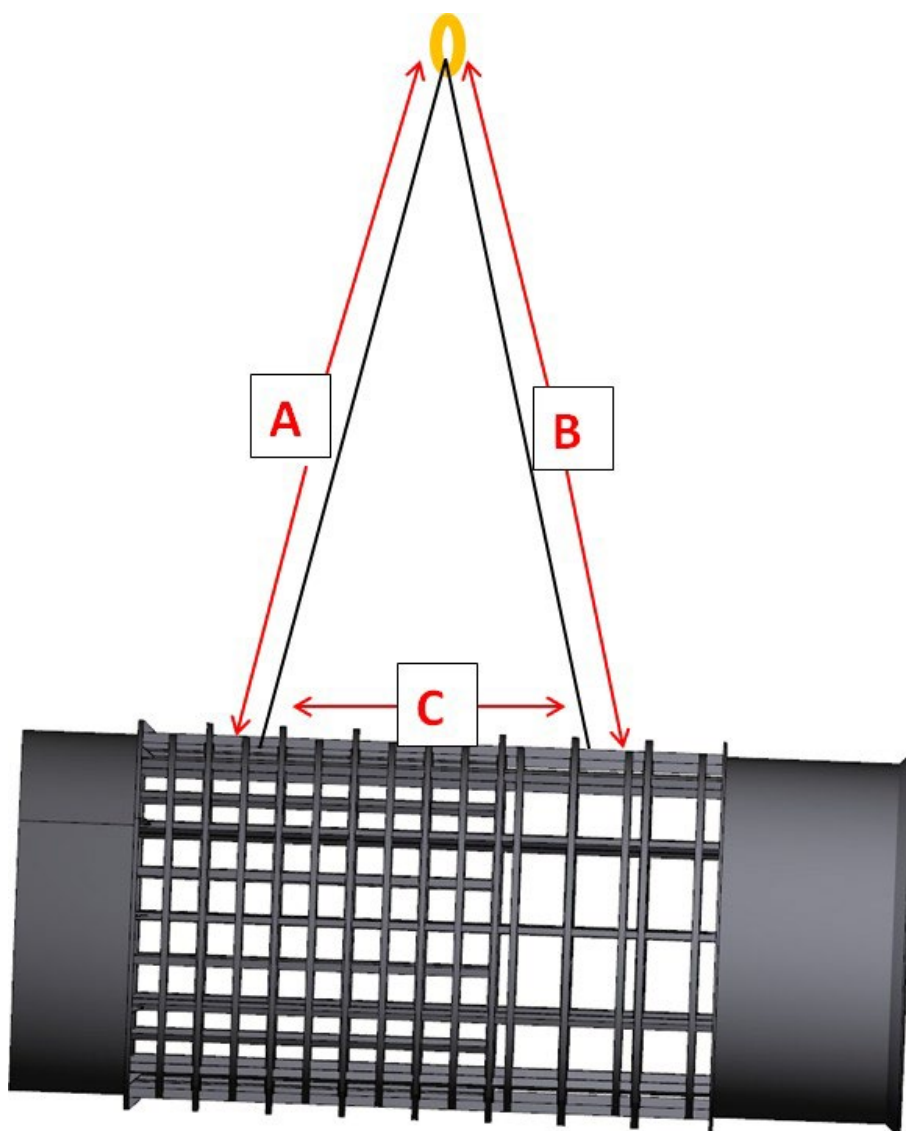
Trommel main frame	
Mass	47000kg
Dimension A	mm
Dimension B	mm
Dimension C	8,000 mm
Dimension D	8,000 mm
Dimension E	5,700 mm
Dimension F	4,100 mm

2.3.2 – Apron feeder assembly



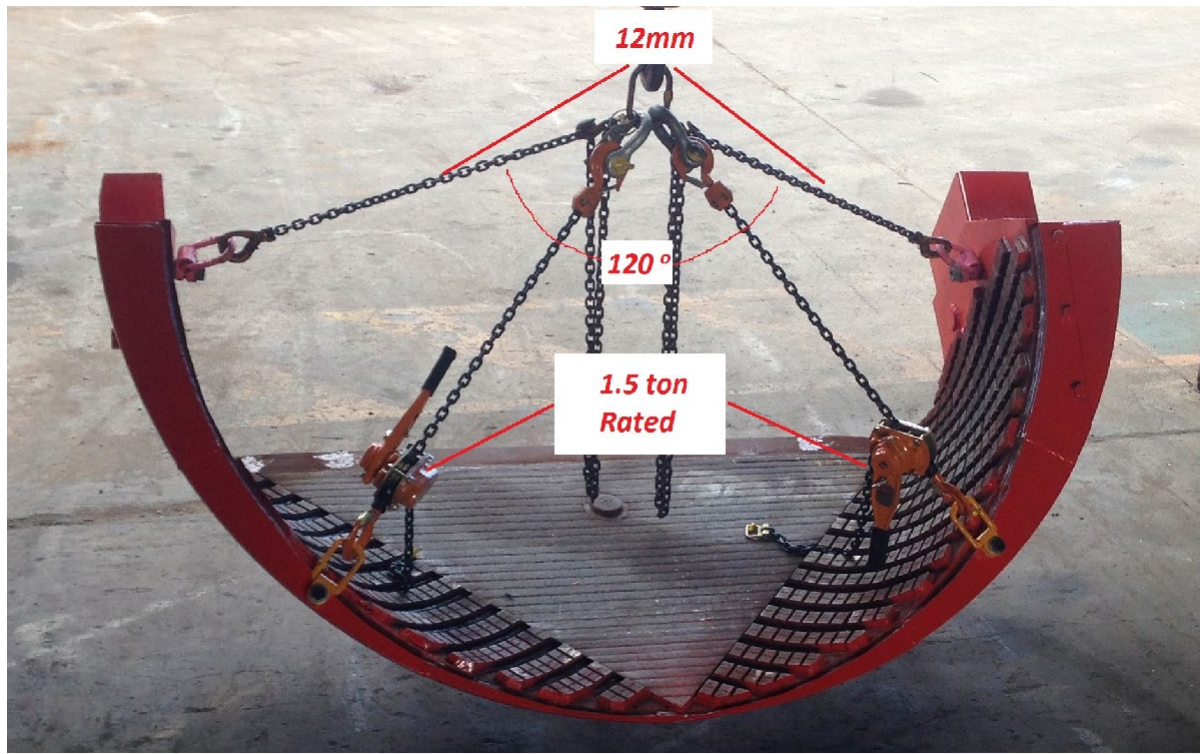
Apron feeder	
Mass	46,000 kg
Dimension A	mm
Dimension B	mm
Dimension C	8,000 mm
Dimension D	8,000 mm
Dimension E	4,500 mm

2.3.3 – Trommel barrel



<i>Trommel barrel</i>	
Mass	39,000 kg
Dimension A	mm
Dimension B	8,000 mm
Dimension C	2,800 mm

2.3.4 – Trommel feed chute



To remove or install the trommel feed chute, sling the chute as per the following sequence:

- Step 1. Connect 12mm lifting chains and shorten to achieve a maximum angle of 120 °.
- Step 2. Connect the 12mm chains to the upper lifting holes by use of 5 ton rated lifting eyes.
- Step 3. Attach 2 x 2 ton rated shackles to the head ring of the 12mm chain slings.
- Step 4. Attach 2 x 1.5 ton (min.) rated lever type chain blocks to the shackles.
- Step 5. Connect the 1.5-ton chain blocks to the lower end of the chute by use of 2 x 1.5-ton minimum bolt-on lifting eyes.
- Step 6. Connect the chain slings to the "Rhino" hook of a non-slewing crane.
- Step 7. Adjust the length of the chain blocks to correct the angle of the chute.
- Step 8. Using the hydraulic extension function of the jib, extend the chute into position.

2.3.5 – Trommel barrel drive assemblies

If it becomes necessary to remove the trommel barrel drive assemblies for the purpose of conducting maintenance, take care to allow for movement of the drive roller in relation to the bearing housings. Adjust the lifting equipment to enable the drive assembly to lift parallel. Use a suitable lifting device to perform the lift.

Refer to site specific requirements.

2.3.6 – Pack A

Pack **A** consists of the following items as per schedule 2.1.

<i>Item No.</i>	<i>Description</i>	<i>Weight</i>
5	L/H Upper ramp side	3.5 ton
6	R/H Upper ramp side	3.5 ton
15	Front lower ramp section	5.6 ton
16	L/H upper bin side	4.7 ton
17	R/H upper bin side	4.7 ton
Pack A	Total of above components	22 ton

2.3.7 – Pack B

Pack **B** consists of the following items as per schedule 2.1.

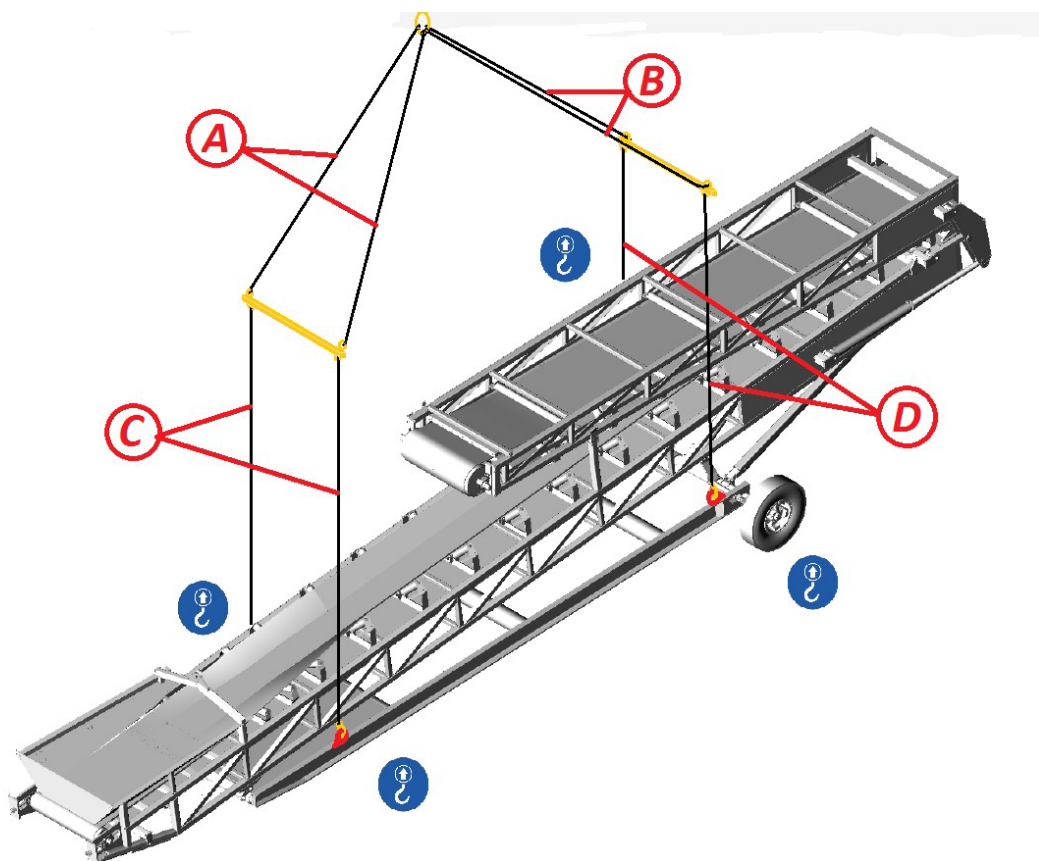
<i>Item No.</i>	<i>Description</i>	<i>Weight</i>
3	Front upper spill beam	2.4 ton
11	Front bin tie	5 ton
19	L/H lower bin side	7.1 ton
20	R/H lower bin side	7.1 ton
Pack B	Total of above components	21.6 ton

2.3.8 – Pack C

Pack **C** consists of the following items as per schedule 2.1.

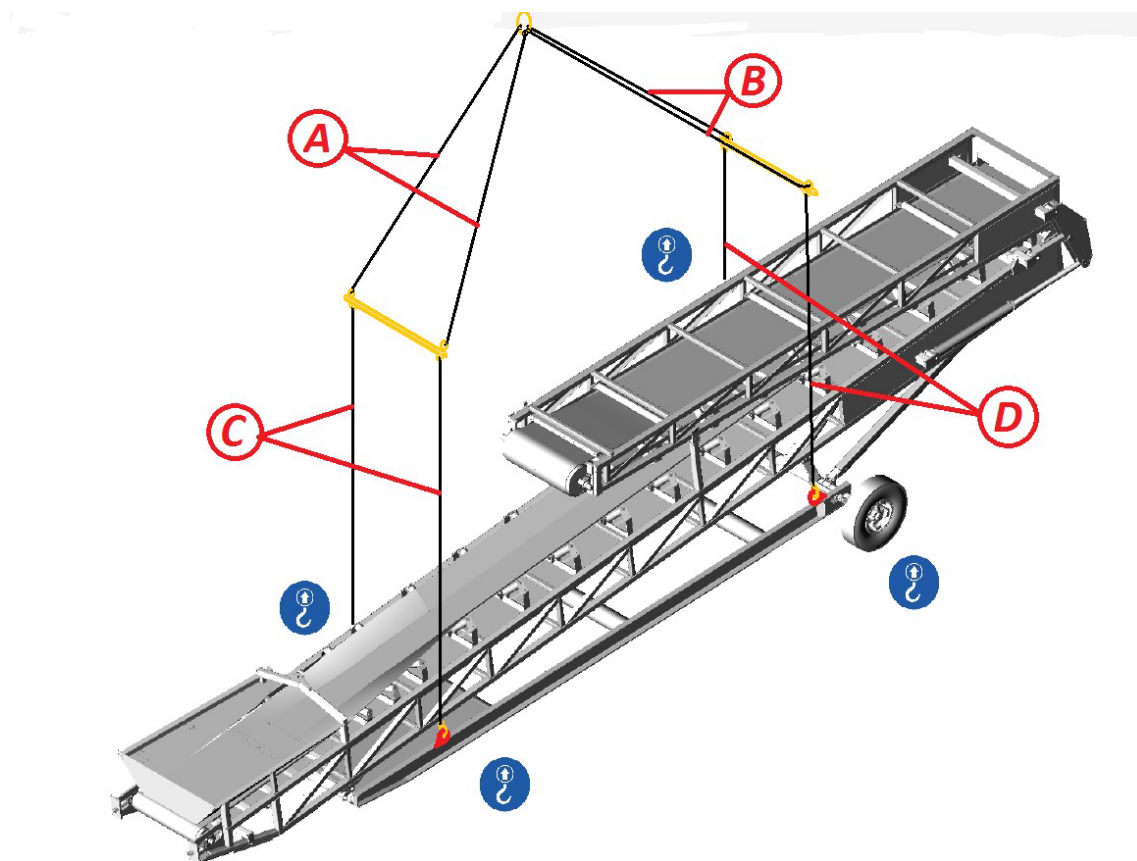
<i>Item No.</i>	<i>Description</i>	<i>Weight</i>
4	Upper rear ramp tie	3.3 ton
7	Front upper ramp tie	2.3 ton
12	Lower rear ramp tie	3 ton
13	L/H lower ramp side	3.5 ton
14	R/H lower ramp side	3.5 ton
18	Rear upper bin section	5.6 ton
Pack C	Total of above components	21.2 ton

2.3.9 26m x 1,200mm conveyor – CV3



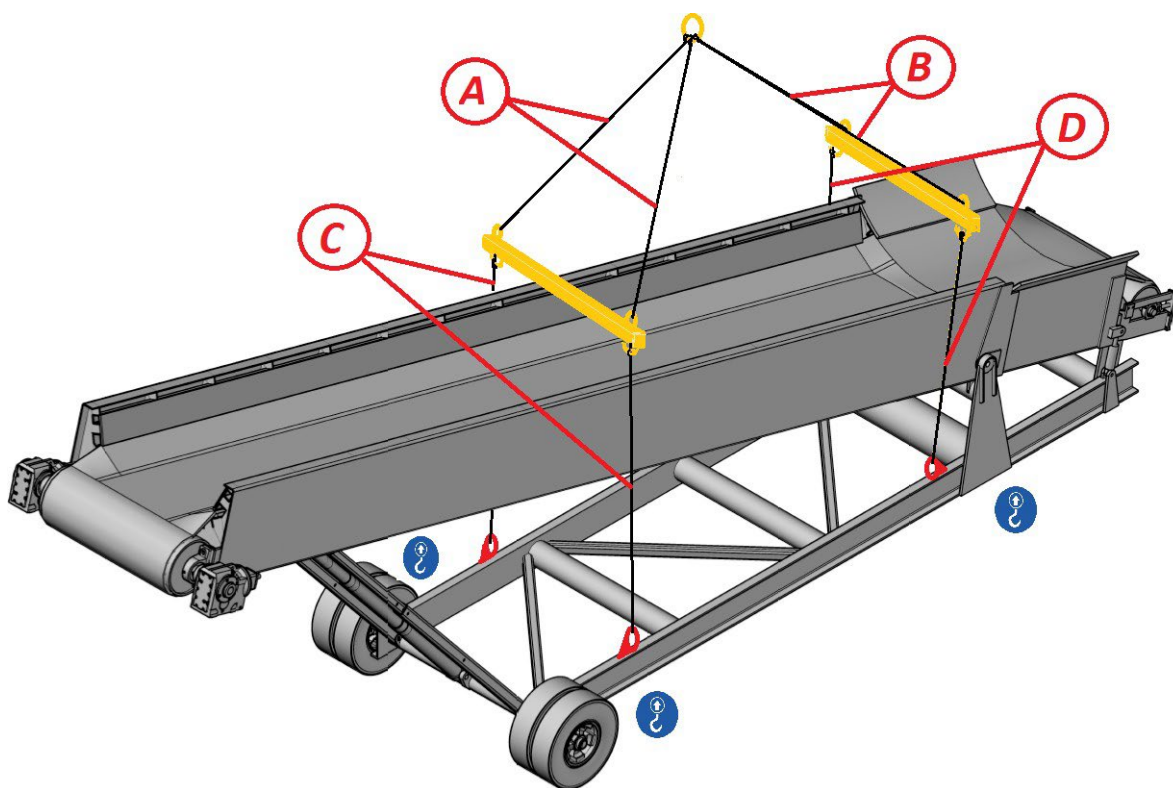
CV3	
Weight	14300KG
Chain Length A	
Chain Length B	
Chain Length C	
Chain Length D	

2.3.10 25m x 2,100mm conveyor – CV2



CV2	
Weight	23000KG
Chain Length A	
Chain Length B	
Chain Length C	
Chain Length D	

2.3.11 15m x 1,800mm conveyor – CV1



CV1	
Weight	20000KG
Chain Length A	
Chain Length B	
Chain Length C	
Chain Length D	

2.4.– Assembly & Disassembly procedures in order of assembly sequence

2.4.1– Prior to commencing assembly

Assembly & Disassembly procedures have been developed to minimise the potential for harm to personnel and plant. There may however be site specific hazards that will need to be considered and risk assessed prior to performing any step of this procedure.

The trommel must be set up on **firm, clear and level ground**, by suitably qualified and experienced personnel. It is important that the site is surveyed and prepared accordingly prior to unloading. This is to ensure that the trommel barrel can be tracked correctly. Please refer to the site civil plan.

- ⚠ Please ensure that any person undertaking any assembly or disassembly related task has read and understood the information in this document prior to commencing any such work to ensure that suitable control measures are in place.
- ⚠ Keep all non-essential plant or personnel well outside the set-up area. (set up exclusion zones)
- ⚠ Only suitably qualified and experienced personnel should be involved in the loading, unloading, assembly and disassembly of this plant.
- ⚠ A hard hat **MUST** be worn by all personnel associated with the loading, unloading, assembly and disassembly of this plant, whenever lifting operations are being performed.
- ⚠ Ensure that effective traffic control measures are in place to keep other non-essential plant items away from the assembly area. (set up exclusion zones)
- ⚠ A visual inspection of equipment must be performed prior to commencing assembly, to ensure that no damage has occurred during transport.
- ⚠ Take care removing any transport lashings/chains as the load may have shifted in transit.

2.4.2 – Main frame – Set-up and levelling

Step 1. Connect a suitable lifting device using the appropriate grade chain slings, to the load rated lifting points as per section 2.3.1 of this document.

Lift and lower the main trommel frame into position on hard, flat, and level ground.

Perform checks to ensure that the frame is **level in both planes**. It may be necessary to raise the frame again and adjust the pad prior to final placement of the frame.

IMPORTANT NOTE

The levelling of the main frame is crucial to the tracking of the trommel barrel. Any excessive cross fall may cause undue load to bearings and gearboxes, reducing their service life.

2.4.3 – Apron feeder assembly – Installation

Step 2. Connect a suitable lifting device using the appropriate grade chain slings, to the load rated lifting points as per section 2.3.2 of this document.

Take care to ensure the chain sling lengths are correct to set the Apron Feeder at the correct angle for ease of installation.

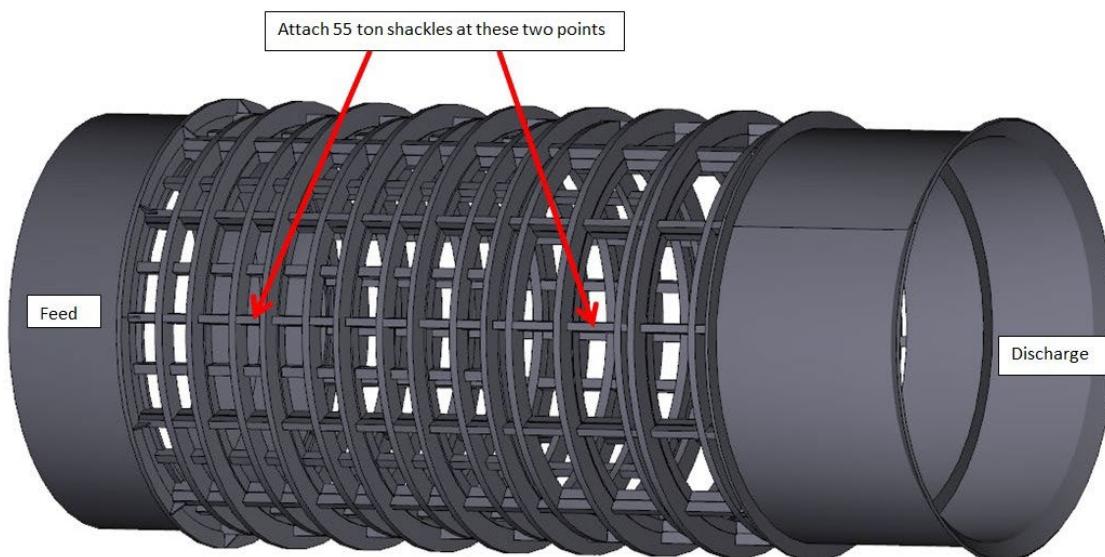
Lift and lower the apron feeder into position at the rear of the trommel main frame ensuring that no dirt or debris is present between the mating faces.

2.4.4 – Trommel barrel - Installation

Care must be taken when slinging the trommel to ensure it is lifted via the marked lifting points. Attach two by 55T load rated lifting shackles at two points as per the diagram below when viewed from above.

- One on the full-length beam, in the 2nd opening from the discharge end,
- The other on the same full-length beam, in the 4th opening from the feed end.

Attach a suitable lifting device as per section 2.3.3 of this manual.



Top view of trommel barrel

2.4.5 – Apron feeder discharge chute – Installation

The apron feeder discharge chute is installed via the discharge opening of the trommel barrel. Due to its geometry and the limited access to its final position, it is important that this procedure is followed.

- *Step 1.* Remove 3 x bolts that secure the removable segment from the upper L/H side of the chute. This is necessary to enable the chute to fit inside the internal diameter of the trommel barrel.
- *Step 2.* Sling the end of the chute that sits closest to the apron feeder using a two leg, 10mm chain sling and adjust the length of the legs to achieve a 120° included angle.
- *Step 3.* Sling the end of the chute that discharges into the trommel barrel using 2 x 1,500kg (min.) rated lifting eyes attached to 2 x 1,500kg (min.) rated ratchet type adjustable chain blocks.
- *Step 4.* Connect the lifting gear to the rhino hook of a non-slew crane and raise the discharge end of the chute using the ratchet type chain blocks.
- *Step 5.* Move the crane into position and extend the jib to carry the chute into position above the locating saddles.
- *Step 6.* Lower the crane jib and extend the adjustable chain blocks to place the chute in position.
- *Step 7.* Re-attach the segment removed in step 1 of this procedure and secure the bolts.

2.4.6 – Apron feeder drive motor and reduction hub assembly

The apron feeder drive motor and reduction hub assemblies can be choked using two synthetic webbing slings. They should be adjusted to lift level which will aid in the alignment of the flange, and installation of the ring of mounting bolts.

2.4.7 – Assembly sequence for bin, ramp, and cross beam structure

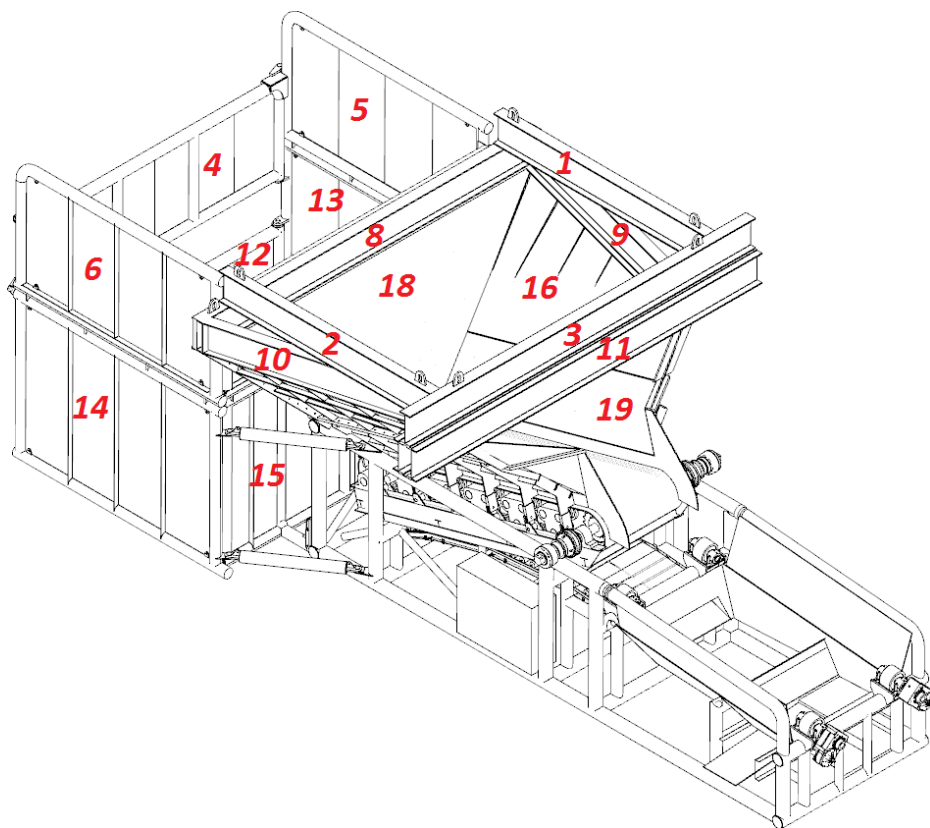
Refer to schedule 2.1 for an inventory of all the required items necessary to assemble this section of the machine.

For the correct slinging technique and weight for each item below, refer to section 2.2 of this manual. The corresponding lifting information is referenced in the right column below.

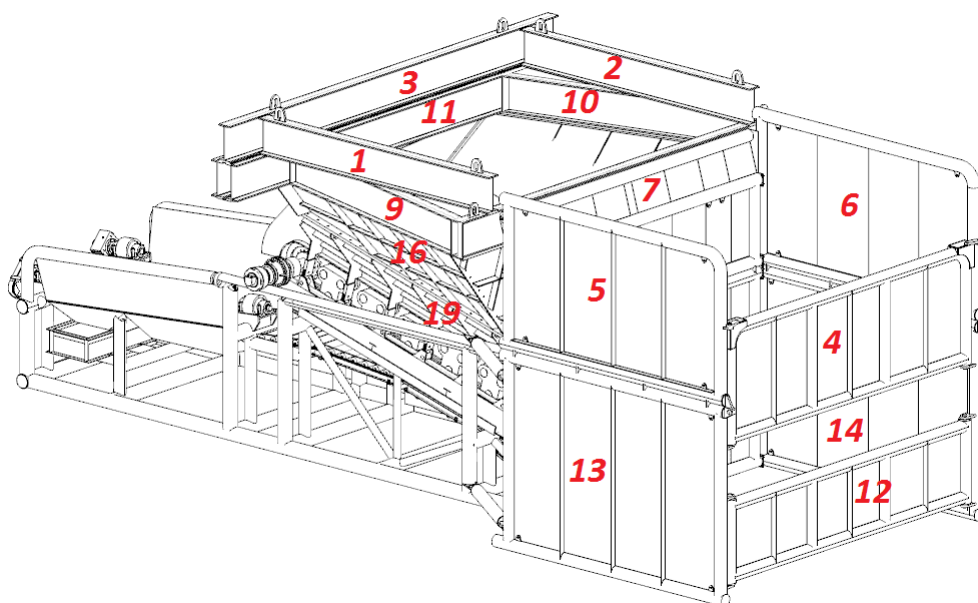
<i>Step</i>	<i>Item No.</i>	<i>Description</i>	<i>Lifting Advice Reference</i>
1	21	Rear lower bin section	2.2.21
2	20	R/H lower bin side	2.2.20
3	19	L/H lower bin side	2.2.19
4	18	Rear upper bin section	2.2.18
5	17	R/H upper bin side	2.2.17
6	16	L/H upper bin side	2.2.16
7	11	Front bin tie	2.2.11
8	10	R/H lower bin tie	2.2.10
9	9	L/H lower bin tie	2.2.9
10	15	Front lower ramp section	2.2.15
11	8	Bump beam	2.2.8
12	7	Front upper ramp tie	2.2.7
13	14	R/H lower ramp side	2.2.14
14	13	L/H lower ramp side	2.2.13
15	12	Lower rear ramp tie	2.2.12
16	6	R/H upper ramp side	2.2.6
17	5	L/H upper ramp side	2.2.5
18	4	Upper rear ramp tie	2.2.4
19	3	Front upper spill beam	2.2.3
20	2	R/H upper spill beam	2.2.2
21	1	L/H upper spill beam	2.2.1

Trommel – Operation and Assembly Manual

The diagrams on the following page show the numbered items that make up the bin, ramp, and cross beam structure. These numbers correspond with the numbers in the column marked "Item No." above.



Front R/H side corner view



Rear L/H corner view

3.0 - Commissioning

3.1 – General Commissioning Procedures

3.1.1– Safety during commissioning

During the commissioning of this plant, there are many known hazards, these include but are not limited to the following.

- i. Mobile plant movements,
- ii. Lifting operations using registered high risk plant items,
- iii. Work at heights,
- iv. The connection of high voltage electrical installations,
- v. The connection of hydraulic lines,
- vi. Manual handling tasks,
- vii. Noise and other environmental factors,
- viii. General housekeeping issues.

It is important that only suitably trained and competent people undertake each commissioning task, and that they are supervised to ensure compliance with relevant statutory requirements and site-specific rules.

During commissioning it is important that isolation procedures, work permits SWMS, and all other statutory regulations are strictly adhered to.

3.1.2 – Commissioning - General

The installation procedure in section 2.4.7 must be followed to ensure the correct installation of the trommel so the plant is prepared for work as intended by the manufacturer.

For the sake of promoting safety, reliability, and productivity, it is of upmost importance that this installation procedure is followed and that each task is signed off prior to commencing production.

4.0 – Electrical System

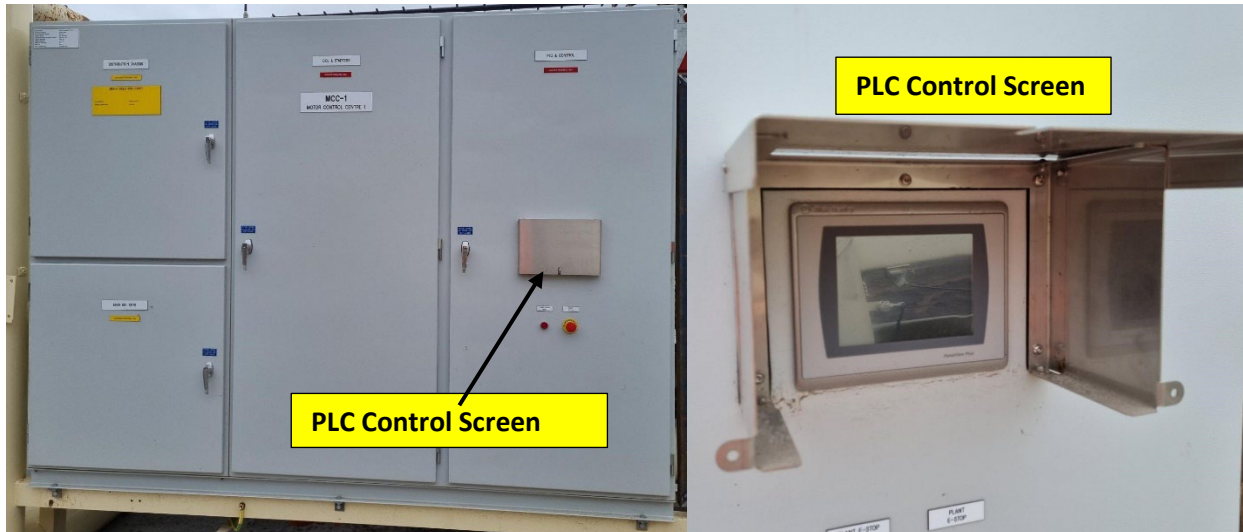


The electrical system on this equipment operates at 415V, under no circumstances should any repair work be attempted by any person other than a licensed electrician. All power is supplied to the trommel Electrical Control Cabinet by a suitable sourced generator.

The monitoring panel features self-diagnostic functionality capable of detecting and advising which circuit has faulted and which breaker to check. This, however, should not be done by anyone other than a licensed electrician.

See appendices for electrical diagram.

Electrical Control Cabinet



5.0 – Hydraulic System

- Some hydraulic circuits of this equipment can trap residual hydraulic pressure on shut down.
- Prior to commencing any repair work or opening any hydraulic circuit on this equipment, visually check the gauges on the Diagnostic and Troubleshooting panel (see below) and ensure that there is no residual pressure in any circuit.

5.1 – Dissipating residual hydraulic pressure from roller clamp circuit

The four trommel bearing clamp circuits maintain hydraulic pressure that may be as high as 8,000 psi in the lines for the purpose of holding the large bearings in position while the plant is isolated.

If it becomes necessary to perform maintenance on one of these circuits, the high-pressure oil must first be dissipated.

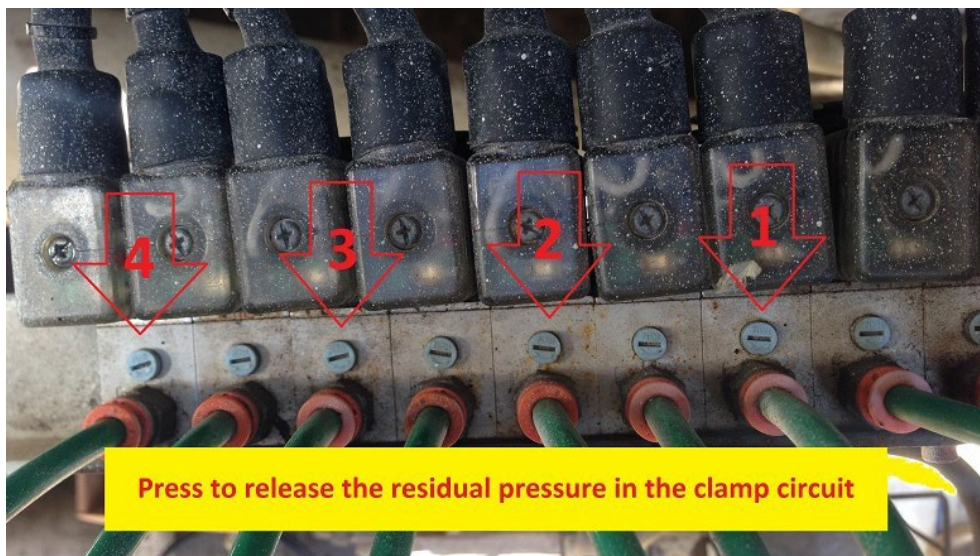


Trommel bearing clamp circuit gauges.

The pressure in the four trommel bearing clamp circuits are displayed on the four gauges marked accordingly on the *Diagnostic and Commissioning Panel*. To release the high-pressure oil trapped in these lines for the purpose of conducting maintenance, there are two methods.

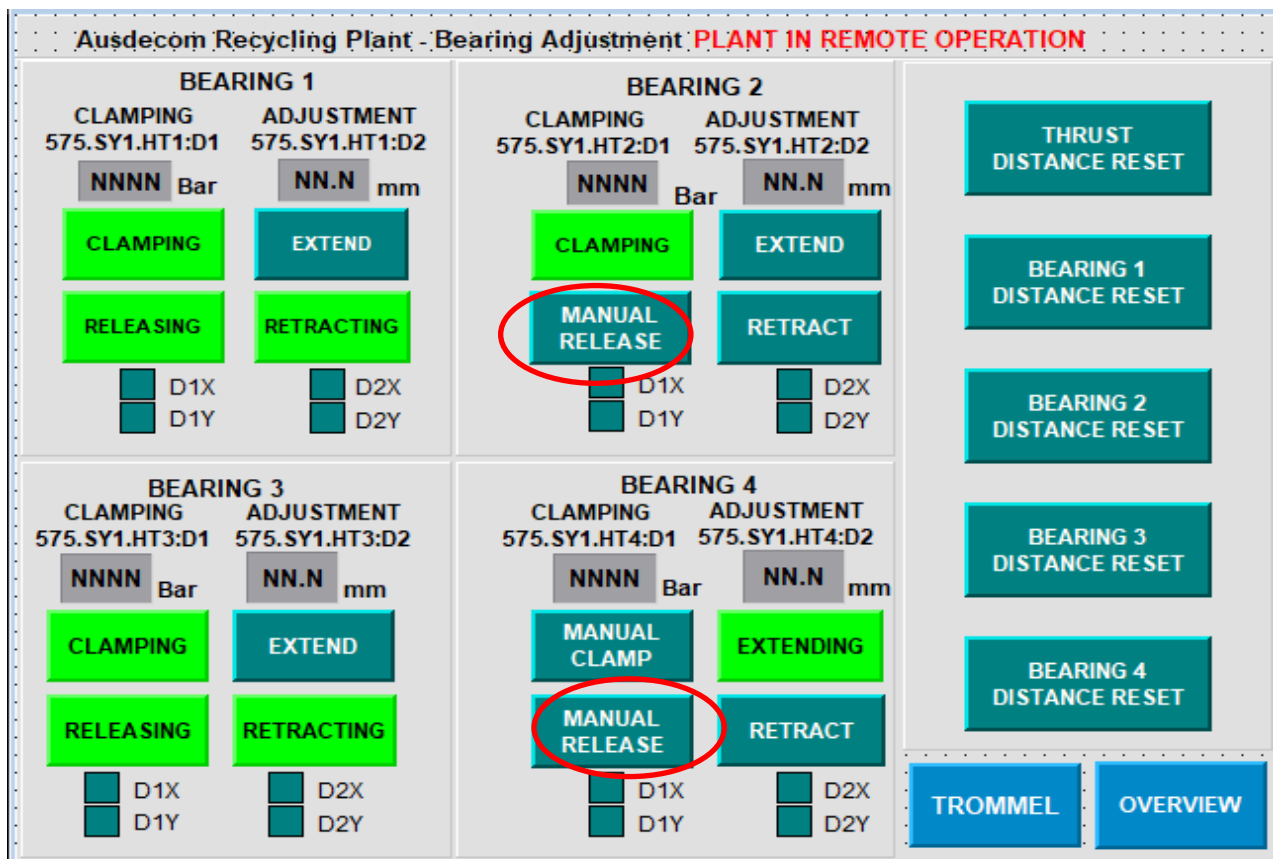
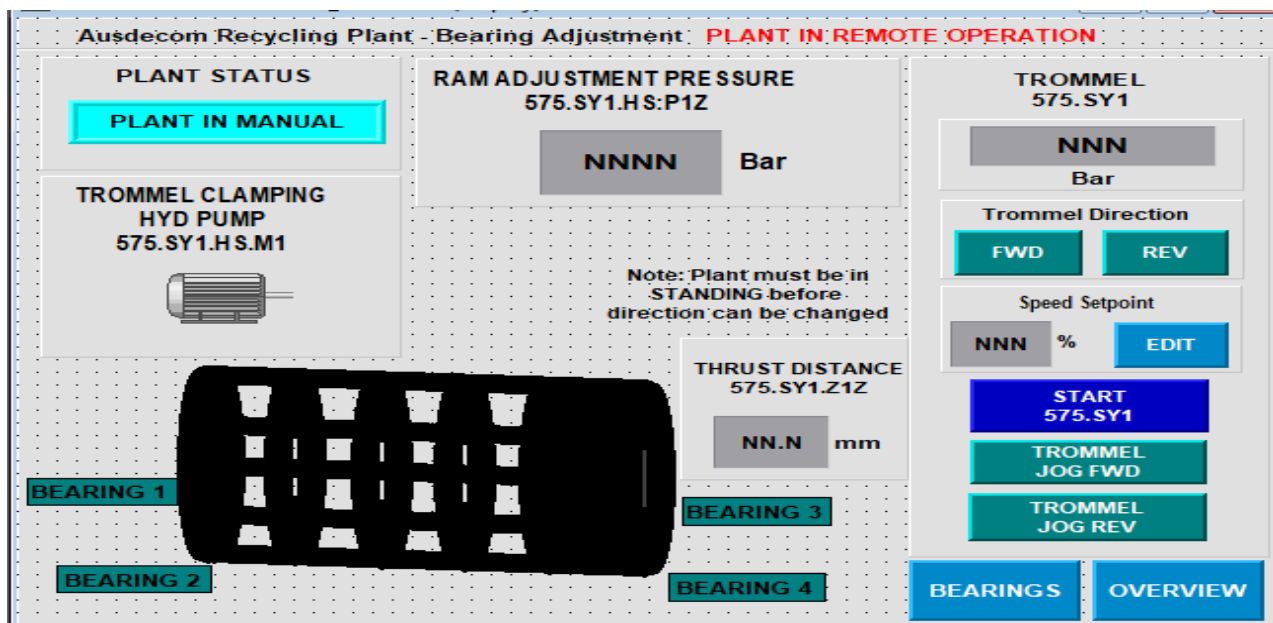
5.1.1 Method 1.

- Step 1. Locate the air relay valve bank behind the main hydraulic tank.
- Step 2. Press the four blue drain buttons identified below with the numbers for their corresponding circuits. 1,2,3 & 4.
- Step 3. Check the four corresponding gauges on the Diagnostic and Commissioning panel to confirm that the pressure has dissipated.



5.1.2 Method 2.

With the PLC Screen powered up and in the “Bearing Adjustment” screen, click on the four “Manual Release” buttons as per below.



6.0 - Operation

6.1 - Locations of Gauges and Controls

The trommel itself has no designated, permanently manned control station. There is however a PLC control panel with diagnostic capabilities mounted on the switchboard and also a panel (hydraulic control gauges) for the purpose of diagnostic and commissioning purposes only which is located at the mid-point of the machine, adjacent to the electric motor and pump assembly.

- ⚠ Access to the Diagnostic and Commissioning panel is restricted by way of two guards on either side of the machine, which are to remain bolted closed while the plant is processing material.
- ⚠ A work permit system has to be developed at site to ensure that at no stage is any person to enter the guarded section of the machine without the authorisation of the production supervisor, or more senior representative on site.
- ⚠ All other guarding integral to the machine is intended to remain in situ and be bolted in position unless the complete plant is isolated and locked out in accordance with the relevant procedure.
- ⚠ Under no circumstance is any person to remove a guard, nor is a work permit relevant for any area other than the access gate for the commissioning/diagnostic panel.
- ⚠ All hardware associated with the installation of guarding is to be always tightened to beyond "finger tight" to ensure that the use of a tool is necessary to unbolt or remove the guard. This is to comply with statutory requirements.
- ⚠ The immediate vicinity of the plant is always a hard hat area, regardless of which stage of the plant life cycle.
- ⚠ Only personnel that are necessary to the diagnostic procedure or commissioning process are to enter the restricted area.
- ⚠ Follow the LOTO procedure before removing any guards. On-site requirements may require a Work Permit, please discuss with site management before commencing any work. Once the guard has been closed and the retaining bolt hardware tensioned, remove your personnel lock from isolator before re-energising trommel.



Diagnostic and Commissioning Panel

The trommel and associated conveyor system is designed to be controlled and monitored via the PLC located on the side of the trommel.

Critical parameters are monitored by way of digital sensors feeding information through a PLC system to PLC display monitor.

A remote device is used by the operator to control movement of the trommel. (stop, start, increase, or decrease speed) The trommel shall be stopped before any personnel approach the PLC.

An alarm has been set up with a siren on start-up, and when the trommel goes into alarm mode.

An exclusion zone of no less than 20 metres should be maintained whenever the plant is in operation and processing material.

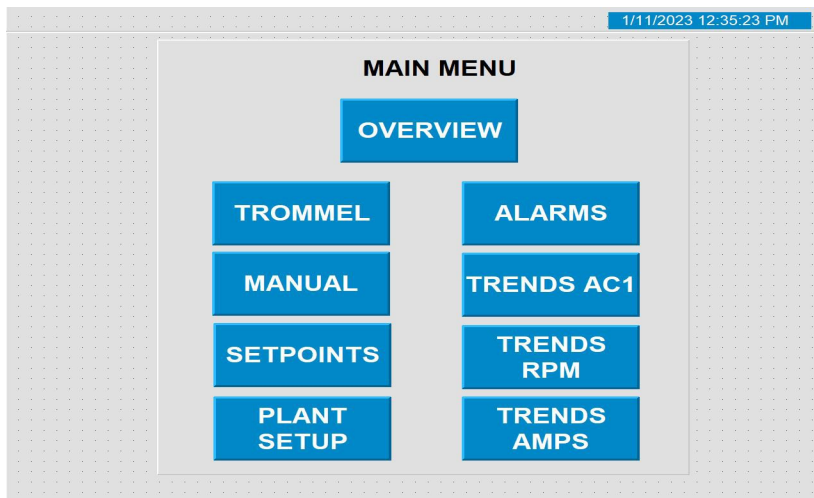
6.2 - Start Up Procedure

- ⚠ The procedure to start the trommel and associated plant items may vary in accordance with site requirements. Please review the relevant Safety Management Plan and ensure compliance.
- ⚠ Only trained and competent personnel are permitted to commence the Start-up procedure.
- ⚠ A pre-start inspection of the plant must be completed on the Fleet Office App, plant number **3500**, documented, and reviewed by the Production Supervisor daily, prior to starting the plant.
- ⚠ All personnel engaged to work on the trommel for that day **MUST** be accounted for prior to initiating the start-up procedure.
- ⚠ Once the production supervisor is happy that the plant is safe to start, the "Start Plant" icon should be clicked on the monitoring screen.

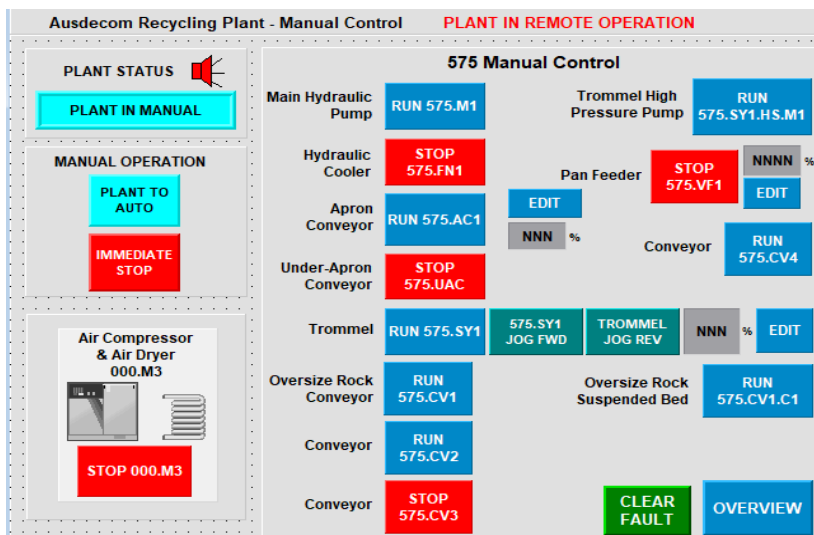
6.2.1 Trommel PLC control panel

The Main Menu

- Press the Overview button to go to the next screen or button to go directly to desired screen.



- Second screen = Manual Control



• Third screen = Over-rides

Ausdec Recycling Plant - Over-rides **PLANT IN REMOTE OPERATION**

575 Drive Speed Bypasses Apron Conveyor: 575.AC1:S1 BYPASSED Under-Apron Conveyor: 575.UAC:S1 BYPASSED Pan Feeder: 575.VF1:S1 BYPASSED Trommel: 575.SY1:S1 BYPASSED Oversize Rock Conveyor: 575.CV1:S1 BYPASSED 2100 Conveyor: 575.CV2:S1 BYPASS CV3 Conveyor: 575.CV3:S1 BYPASSED CV4 Conveyor: 575.CV4:S1 BYPASS Temperature Bypasses Main Motor Gearbox: 575.GB1:T1 BYPASSED Hydraulic Tank: 575.TK1:T1 BYPASSED Main Motor Thermistor: 575.M1:T BYPASSED	575 Drive Pressure Bypasses 575.AC1:P1 BYPASSED 575.UAC:P1 BYPASSED 575.VF1:P1 BYPASSED 575.SY1:P1 BYPASSED 575.CV1:P1 BYPASSED 575.CV2:P1 BYPASSED 575.CV3:P1 BYPASS 575.CV4:P1 BYPASSED Level Low Bypasses 575.TK1:L1 BYPASSED Suspended Bed 575.CV1.C1:P1 BYPASSED	Plant Air PRESSURE OK BYPASSED Power Bypass POWER OK BYPASSED Trommel Adjust Pressure Bypass 575.SY1.HS:P1 BYPASSED Trommel Ram Pressure Bypass 575.SY1.HT1 BYPASSED 575.SY1.HT2 BYPASSED 575.SY1.HT3 BYPASSED 575.SY1.HT4 BYPASSED
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OVERVIEW

• Fourth screen = Main Control Screen

Ausdec Recycling Plant **PLANT IN REMOTE OPERATION** 9/01/2024 11:04:24 AM

Feed Speed Control: MANUAL, AUTO, AUTO FEED SETUP

Under-Apron Conveyor 575.UAC: NNN Bar

575.SY1 Trommel: NNN Bar

575.CV1 Bar, 575.VF1 Bar

575.AC1: NNN Bar, 575.AC1.GB1: NNN °C, 575.AC1.GB2: NNN °C

575.CV2 Bar, 575.CV3 Bar

575.M1 Bar, 575.GB1: NNN °C

575.TK1: NNN °C, 575.FN1: NNN °C

PLANT CONTROL: STOP PLANT, PLANT ENABLE, IMMEDIATE STOP

PLANT STATUS: PLANT IN MANUAL

TROMMEL SWITCH BOARD EMERGENCY STOP ACTIVE PRESS RESET

CLEAR FAULT, MAIN MENU

• Fifth screen = Plant Set Points

Ausdec Recycling Plant - Plant Set-Points **PLANT IN REMOTE OPERATION**

Pressure High Alarm Setpoint		Speed Low Alarm Setpoint	
Apron Conveyor 575.AC1	NNN bar EDIT	N.N rpm EDIT	
Under-Apron Conveyor 575.UAC	NNN bar EDIT	N.N m/s EDIT	
Trommel 575.SY1	NNN bar EDIT	N.N rpm EDIT	
Oversize Rock Conveyor Fixed Speed 575.CV1.V1	NNN bar EDIT	N.N m/s EDIT	
Oversize Rock Conveyor Variable Speed 575.CV1.V2	NNN bar EDIT		
2100 Conveyor 575.CV2	NNN bar EDIT	N.N m/s EDIT	
Conveyor 575.CV3	NNN bar EDIT	N.N m/s EDIT	

OVERVIEW

- Sixth screen= Bearing Adjustments**

Ausdec Recycling Plant - Bearing Adjustment **PLANT IN REMOTE OPERATION**

PLANT STATUS PLANT IN MANUAL	RAM ADJUSTMENT PRESSURE 575.SY1.HS:P1Z NNNN Bar	TROMMEL 575.SY1 NNN Bar
TROMMEL CLAMPING HYD PUMP 575.SY1.HS.M1 	Note: Plant must be in STANDING before direction can be changed	
THRUST DISTANCE 575.SY1.Z1Z NN.N mm		Trommel Direction FWD REV
BEARING 1 BEARING 2 BEARING 3 BEARING 4		Speed Setpoint NNN % EDIT START 575.SY1 TROMMEL JOG FWD TROMMEL JOG REV
		BEARINGS OVERVIEW

- Seventh screen = Bearing Adjustment**

Ausdec Recycling Plant - Bearing Adjustment **PLANT IN REMOTE OPERATION**

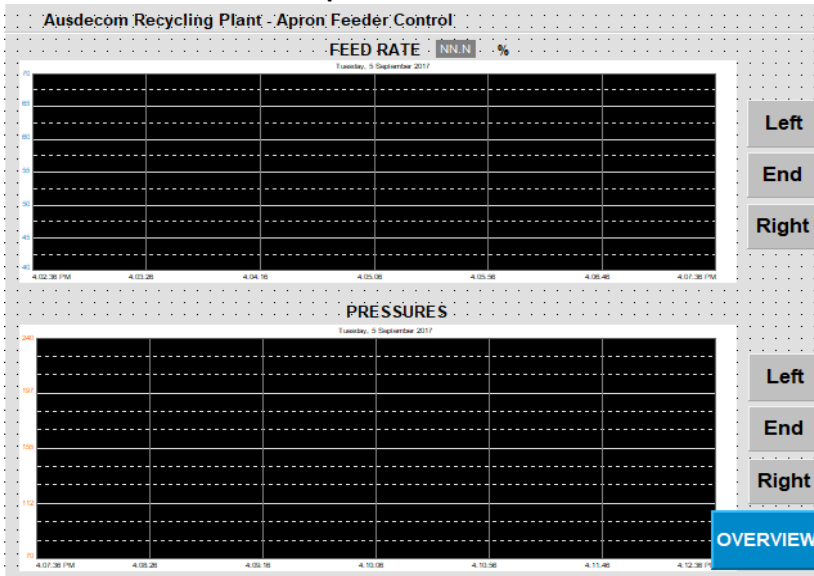
BEARING 1 CLAMPING 575.SY1.HT1:D1 NNNN Bar CLAMPING RELEASING D1X D1Y D2X D2Y	BEARING 2 CLAMPING 575.SY1.HT2:D1 NNNN Bar CLAMPING MANUAL RELEASE D1X D1Y D2X D2Y	THRUST DISTANCE RESET BEARING 1 DISTANCE RESET BEARING 2 DISTANCE RESET BEARING 3 DISTANCE RESET BEARING 4 DISTANCE RESET
BEARING 3 CLAMPING 575.SY1.HT3:D1 NNNN Bar CLAMPING RELEASING D1X D1Y D2X D2Y	BEARING 4 CLAMPING 575.SY1.HT4:D1 NNNN Bar MANUAL CLAMP MANUAL RELEASE D1X D1Y D2X D2Y	TROMMEL OVERVIEW

- Eight screens = Alarms**

Ausdec Recycling Plant - Active Alarms **PLANT IN REMOTE OPERATION**

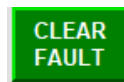
Alarm time: 18/01/2024 3:32:38 PM Acknowledge time: 18/01/2024 3:32:38 PM Message: ABCDE FGHIJK LMNOPQ RSTUV WXYZ ABCDE FGHIJK LMNOPQ	Safety Devices Test SIREN OFF ORANGE STROBE OFF	HISTORICAL ALARMS OVERVIEW
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- Ninth Screen= Apron Feeder Control

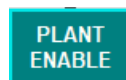


6.2.2 Startup Procedure:

- Reset all faults and "E" Stops before starting the plant. Resetting any faults which have been rectified can be done by pressing the clear fault button located on the bottom right of Screen 4.



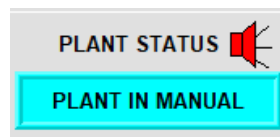
- Once all devices are healthy and no active alarms are present. Press the plant enable button.



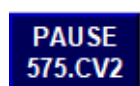
- When the plant enable button is pressed, the start plant button will appear and give you a short period of time to start the plant by pressing the start plant button in the top left-hand corner. A siren will sound, and Red Flashing light will be indicated prior to the trommel starting, as a general warning to all personnel that the plant is about to Start.



- The plant should start in sequence. The stages of the sequence will be displayed in the plant status panel.



- At any time, you can pause/stop then startup again individual items by pressing their corresponding buttons.

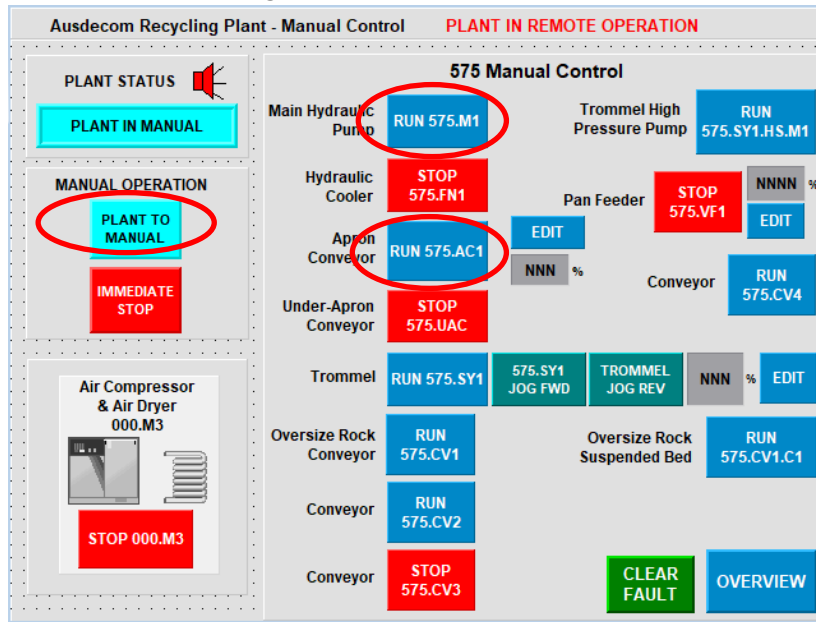


6.2.3 Start in Manual Mode

- Press "Plant in Manual" button on Screen in 6.2.1

Trommel – Operation and Assembly Manual

- The following screen will appear.



On this screen you will have to click on the “Plant to Manual” button in the “Manual Operation” box.

The plant status should say “Plant in Manual” just like in the picture above.

- Press the “Clear Fault” button before starting the plant.

Once in manual mode you can then start the individual devices using the RUN button.



or the STOP buttons depending on the state of the device.

To go back into Auto mode, you will need to press the “Overview” button (bottom right corner) and return to screen 4.

Remote control

This device has 4 buttons.

- Button 1: Remote Apron Feeder (AC1) Start
- Button 2: Remote Apron Feeder (AC1) Stop
- Button 3: Remote Apron Feeder (AC1) Increase Speed
- Button 4: Remote Apron Feeder (AC1) Decrease Speed

6.2.4- Shut Down Procedure

 This procedure applies to a controlled stoppage only, in the event of an emergency the “Immediate Stop” icon should be clicked without delay.

Prior to stopping the plant under normal operating conditions, the following process should be followed.

- Step 1. Make positive communication with the loading operator/s to advise them to cease feeding the plant.
- Step 2. Confirm the feed has ceased.
- Step 3. Monitor all product belts until they are all clear of product.
- Step 4. The plant can be stopped at any time immediately without any sequence stopping by pressing the immediate stop button located in the top right-hand corner of the overview screen.

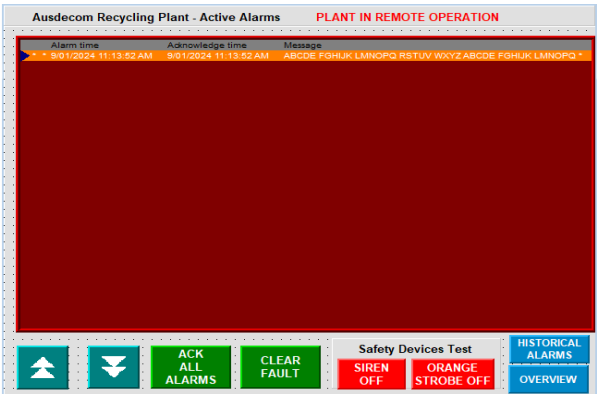


- Step 5. If you would like to stop the plant in a controlled sequence stop allowing all the belts to purge before stopping, then press the stop plant button above the immediate stop button.



6.2.5 Alarms

Alarms can be viewed and are logged in the alarm’s pages, where they can be acknowledged and cleared.



6.5 – Critical parameters

The trommel has a PLC system incorporated into it that performs the majority of the monitoring and displays the critical parameters. These parameters were identified as anything that could affect safety, productivity, or reliability.

If the PLC detects an out of parameter reading, it takes one of three pre-programmed courses of action as determined by the design team. These are.

6.5.1 Stop,

6.5.2 Stand, and

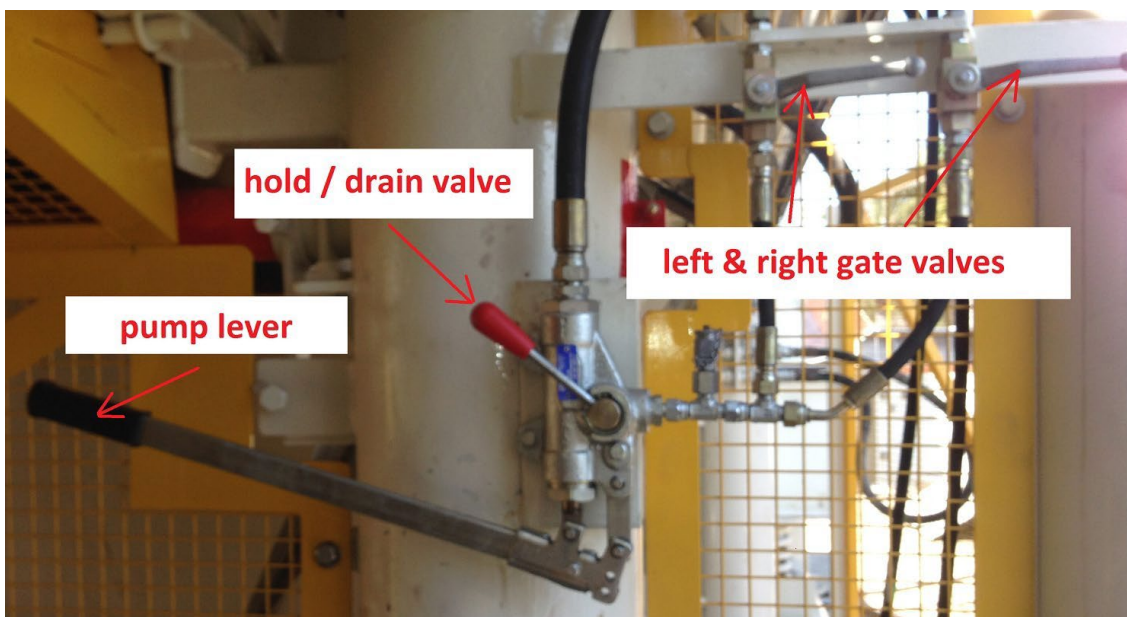
6.5.3 Run.

These responses can be reprogrammed as necessary via the PLC.

6.6- Operation of the 2100mm belt tracking system

The 2,100mm wide conveyor belt that engages in the trommel beneath the first aperture of the barrel can be tracked while the belt is turning, without the need to remove guards and make manual adjustments.

A remote hydraulic system has been incorporated into the machine enabling easy adjustment of the 2,100mm belt tracking. The components of the system are identified below.



To operate the 2100mm belt tracking system, follow the procedure below.

- Step 1. Close the hold / drain valve by putting the lever in the fully raised position,
- Step 2. Open the left or right gate valves depending on which side of the conveyor requires additional tension on the tail drum,
- Step 3. Operate the pump lever handle to pump additional oil into the selected circuit,
- Step 4. Lock off the relevant gate valve to hold the cylinder at the required position.

Note: In order to release the tension off one side of the tail drum, open the corresponding gate valve and lower the hold/drain valve lever slowly.

[7.0 – Appendices](#)

[7.1 Electrical diagram](#)

[7.2 Relevant SWMS and SOP's](#)