 Eskom	SCOPE OF WORK	Engineering
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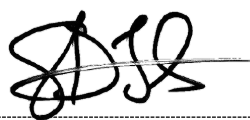


S Malgas

System Engineer

Date: 20/01/2021

Reviewed By:



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Date: 20/01/2021

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Date: 20/01/2021

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1. Scope Compilation References

SCOPE COMPILATION REFERENCES				
SOURCE & Ref No.	Yes	No	N/A	Comments
Inspections				
Return to service data packages				
Maintenance Strategy with Rev number				
SAP defects (attach list as appendix)				
GHRMS (STEP) reports (Generation Heat Rate Management System)				
Online Condition Monitoring				
Pre-outage performance test results				
Post outage performance test results				
GPSS/ Plant Performance data on UCLF incurred				
OMS / IIRMS recommendations (Audits Reports)				
Risk controls (IRM system)				
Previous audits and reviews (e.g. ERAP)				
Engineering Change Requests (Projects)	X			
LOPP strategy reports				
URS				
Philosophy (Outage)				
Condition Monitoring Report				
VA/PHD Viewer trends				
Corrective Actions				
CARAB reports				
Statutory Requirements				
Grid code requirements				
Waivers and Exemptions				
Calibration requirements				
Previous Outage SOW variations				
Post Mortems Actions from previous outages				
Pre-Outage plant walks				
Risk based inspection (RBI) report				
Simulation, TOIs, OON, SI				
SUBSYSTEM				Y / N
				Page №

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2. Background

Kendal Power Station vibrating feeders (UF-3200/2100-2xBLz50-75/6) located at surge bin 1 and 2 have been in operation since the early 1990's and have passed the recommended design life. These vibrating feeders started to deteriorate below 900 t/hr versus the original design rate of 1600 t/hr and this was due to change in coal quality. In 2016 a project was established to replace all vibrating feeders in order to eliminate production risk. To date only 4 vibrating feeders have been installed i.e. 1 on surge bin 1 and 3 on surge bin 2. There are a total of 8 vibrating feeders outstanding which needs to be installed and commissioned. The station is in the process of procuring the remaining feeders and a service provider for installation shall be required.

The Feeder is mounted on steel coil springs with base plates, packers and pedestals for bolting onto surge bin 2 bottom structure. The feeder is of a pan structure installed with 2 x 4.53kW vibrating motors. The total mass of the vibrating feeder is 2760 kg. Below is the description of the vibrating feeder.

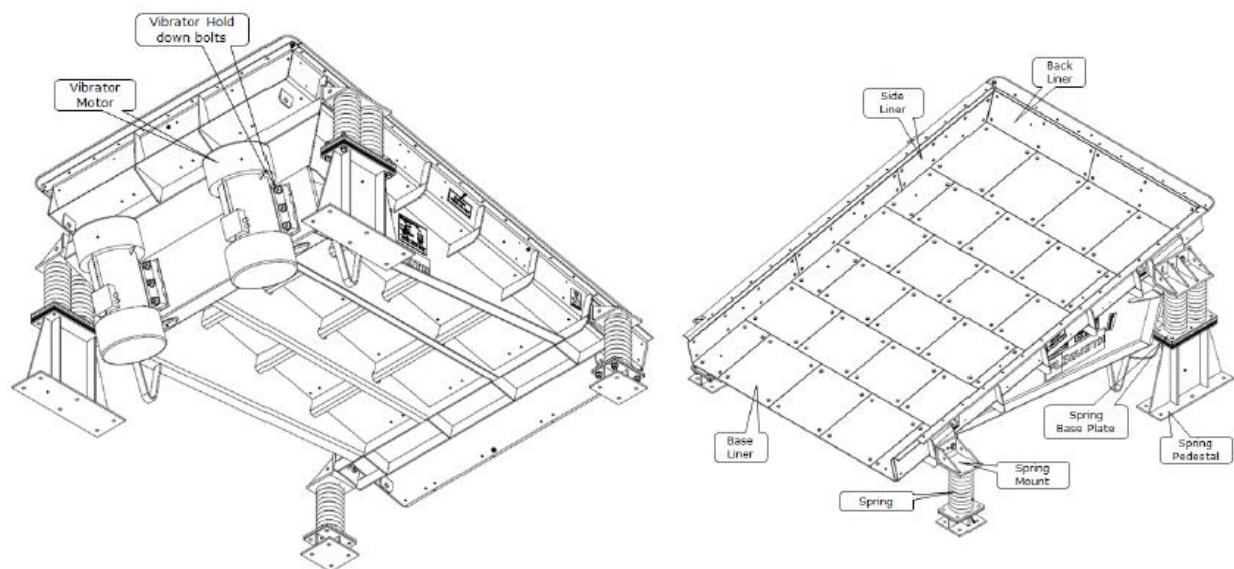


Figure 1: Vibrating feeder

3. Objectives

Objective of this scope of work is to source out competent contractor that has the capability installing and commissioning the vibrating feeder successfully.

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4. Detailed Work Description

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Activity	Work Execution	Comment
1.	Contractor to provide a service to uninstall old vibrating feeders on surge bin 1 and 2	
1.1.	Installation of lugs on vibrating feeder chutes. Note that the supplier/contractor should provide lugs.	
1.2.	decommissioning of old piping of dust suppression system on vibrating feeder	
1.3.	Removal of handrails to allow free movement of the feeder. Upon completion proper re-installation thereof Note that no cutting of any structural member shall be permitted without the approval of the system engineer	
1.4.	<ul style="list-style-type: none"> Isolation and de-isolation of the bin using splice bars Removal of cross section beam that balances the splice bar structure Servicing of splice bar ramming mechanism Replacement of damaged sliding beams for ramming mechanism Installation of driving mechanism for ramming device Purchase of cross beam structure for splice bars <p>Note that method statement to be supplied during tender stage</p>	
1.5.	Removal of the old vibrating feeders. Note that the contractor shall decide if the feeder will be removed as a complete unit or it will be removed in sections. NB: removal of the feeder must be within time frame as projected by the project manager i.e. 2 days for removal	
1.6.	<ul style="list-style-type: none"> Refurbishment of all vibrating feeder chutes Installation of wear liners on all vibrating feeder outlet chute Purchasing of wear liners for vibrating feeder chutes 	
1.7.	Installation of new vibrating feeders and associated components	

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	Note that drilling of holes and cutting of structure to be as per angle iron or beams recommended back mark cater for the new feeder shall be the responsibility of the contractor	
1.8.	Properly adjusting the mouth of chute to prevent damage of the feeder	
1.9.	Installation of rubber dusters/covers	
1.10.	Commissioning of the feeder Contractor to verify vibrating feeder clearances based on drawing AU-465190-D001 provided by FLSmidth Specified clearances: Vertical = 75mm Horizontal = 75mm Lateral = 30mm Note that this section requires all disciplines i.e. Mechanical, electrical and C&I engineering	
1.11.	Contractor to check and verify that hold down bolts on vibrator motors is tight and secure.	
1.12.	Upon completing quality check on vibrating motor, the contractor shall assure that all vibrating motor guards are correctly and securely installed	
1.13.	The contractor shall on as an when required basis to assist on any technical work required during the commissioning of the vibrating feeder	
1.14.	On completion of cold commissioning the contractor shall de-isolate the vibrating feeder by removing the spile bars in preparation for hot commissioning	
1.15.	Contractor to assure that all rubber seals are intact after hot commissioning	
1.16.	Contractor shall assure that all debris are removed from the plant prior hand over	
1.17.	Contractor to assure that QCP is in place and approved by system engineer prior execution	
1.18.	Contractor to provide own equipment related to the job	

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1.19.	Re-installation of the hand rail	
1.20.	Removal and repositioning of the bracing beams to allow sufficient clearance of the motor	
2.	Conduct house keeping	

Additional

- Contractor to assure that QCP is in place and approved by Eskom
- Contractor to have own personnel who will take work permit
- Contractor to have own safety rap
- Contractor to be have adequate rigging knowledge
- Contractor to provide own rigging equipment including a mobile crane, transport to carry the feeder and all associated equipment related to the job i.e. including welding equipment
- All activities related to uninstallation and installation shall be executed by the contractor
- It is the responsibility of the contractor to pick up and transportation of the feeder from designated area to the surge bin
- The contractor shall transport the old feeder from the surge bin to the designated area
- The contractor shall provide mobile rigging equipment to carry the vibrating feeder of 5tons
- The contractor shall be responsible for installing isolation bars i.e. spiral bars to prevent coal form falling. Upon completion of installation the contactor shall again remove all spiral bars
- It is the responsibility of the contractor to maintain house keeping

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Exclusions

- All EC&I isolation shall be done by Kendal EC&I department
- All electrical cabling shall be done by Kendal Power Station or third party
- Cleaning and removal of coal before work exclusion shall be done by OPS station cleaning
- Scaffolding shall be installed and approved by Kendal Power station third party but it shall be the responsibility of the contractor to assure that its safe
- Spile bar isolation equipment (but it is the responsibility of the contractor to assure that it is working)
- Testing and commissioning to be done by both contractor and Eskom representative

Cautions

- The Items weighing over 20 Kg should be lifted by either using mechanical lifting devices or by two persons.
- Potential risk of falling objects can occur. Do not stand/work under a suspended load during the lifting of any assembly.
- Always use the lifting lugs that have been load tested. Avoid bumps and sharp blows when hoisting the Feeder.
- Never lift the Feeder from one corner, as twisting may result.
- Site specific Job Safety Analysis (JSA) to be completed before lifting.
- Lifting to be done by qualified personnel.
- Care must be taken when moving around the machine which presents a trip hazard.
- Ensure immediate area around the machine is free from trip hazards and falls.
- Use mechanical aids and engage multi-person team with a spotter while performing this task.
- Ensure all personnel involved in the task are trained properly before starting any work
- Lifting points have been provided for the attachment of shackles, and are indicated on the lifting diagram plate attached to the side of the Feeder
- Feeder should always be lifted using spreader beam as per lifting chart.
- During lifting, dust seal strips directly above the spring mounts should temporarily be removed to avoid damage.
- Dust seal strip must be installed after lifting and before starting the machine.
- The Feeder must always be placed on timber blocks, placed under the spring pedestals or side plates when pedestals have not been fitted, so that the side plates do not come in contact with the ground.
- Care should be taken to prevent any possible damage to the paintwork whilst attaching lifting equipment.

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Vibrating feeder critical information

- Total Feeder Mass – 2760 kg
- Feeder Sprung Mass – 2600 kg
- Mass of Feeder Springs & Base plates – 160 kg
- Mass of Pedestals – 164 kg
- Total length of the feeder – 3260 mm
- Total width – 2280 mm
- Total height – 1463 mm
- Major components are shown on the figures below

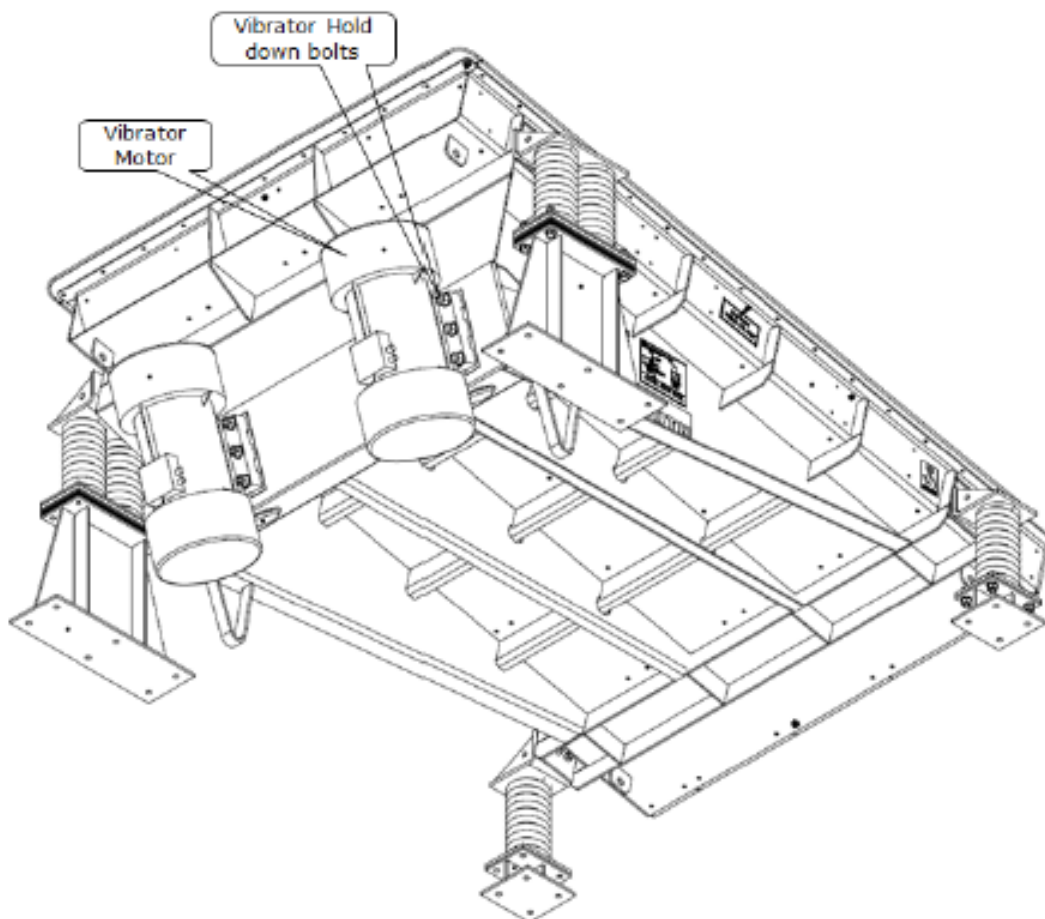


Figure 1: Feeder – Major Components 1

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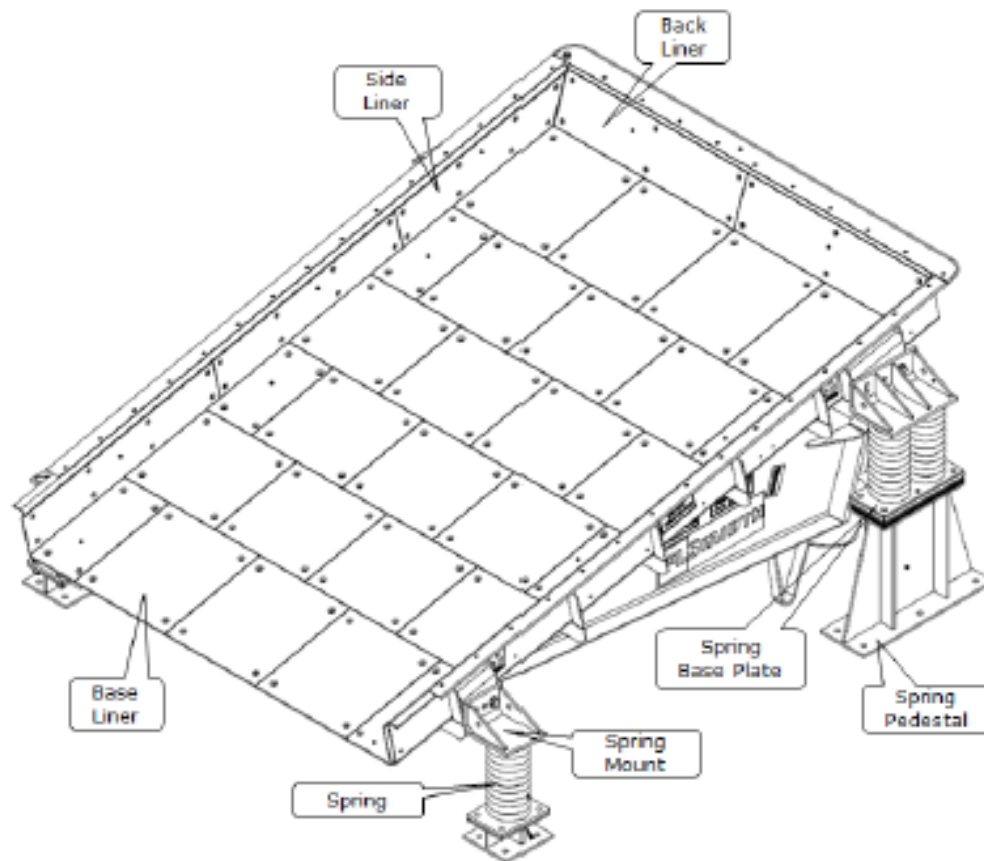


Figure 2: Feeder – Major Components 2

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5. Inspection and commissioning

5.1 Inspection sheet

Item	Task	Status		Comment
		Yes	No	
1	Vibrating feeder clearance sufficient and installed as per drawing AU-465190-D001			
2	All vibrating motor covers in place			
3	All electrical cabling properly secured			
4	All hold down bolts properly secured			
5	All vibrating springs installed correctly			
6	No damaged springs			
7	Rubber seal correctly installed			
8	Vibrating feeder area is clean			
9	All hand rails are put back in position			

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5.2 Cold commission procedure

- Assures that there's no coal on the feeder pan prior clearing of the permit
- Suspend PTW and put in sanction for test
- Open both vibrating feeder motor covers for direction check
- Have 1 individual to operate the feeder from the switch gear (preferable an operator) and one individual on the feeder motor to verify direction
- Place feeder on local control
- Start the feeder on local and check for rotational direction
- Rotational direction should be as indicated on the back of the vibrating feeder
- If the direction is incorrect, electrical section should correct it
- If the direction is correct then stop the feeder and place back the cover of the motors
- If abnormal operating conditions exist, shut down immediately, report
- Switch from local control to remote control
- Start the feeder from the control room and monitor
- Conduct dry run and take measurements

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Dry run sheet

Nr	Task	Status		Outcome/Comment
		Yes	No	
1	Direction test performed			
2	All Motors starting simultaneously			
3	Measure free length of all springs			
4	Run feeder without load			
5	Does the feeder touch any part of the structure while running empty			
6	Is there an abnormal noise coming from the vibrating motors			
7	Record VSD RPM NB: initial frequency setting to be at 50Hz			
8	Check length of stroke NB: length of stroke can be obtained from the stroke indicator on the Feeder. Observe the stroke indicator when Feeder is stationary. and notice two lines running transverse to the line of action, one is calibrated the other is not. When the Feeder is running these two lines will appear to cross, the stroke can be read from the intersection of these lines and the calibrations.			

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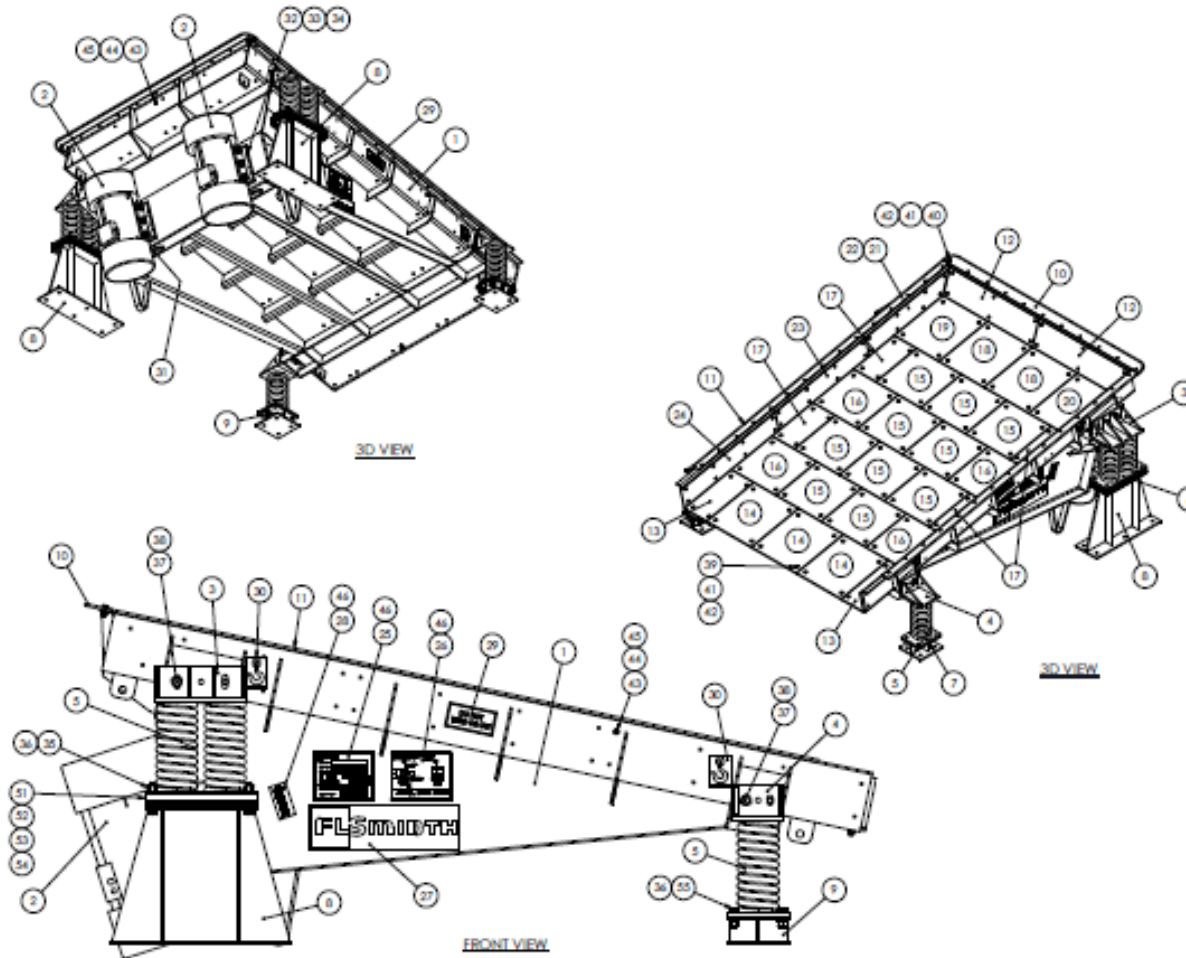
Hot commissioning

Nr	Task	Status		Outcome/Comment
		Yes	No	
1	Spile bar removed from feeder inlet			
2	Measure compressed length of all springs			
3	Run feeder with load			
4	Does the feeder touch any part of the structure while running empty			
5	Is there an abnormal noise coming from the vibrating motors			
6	Record VSD RPM NB: Initial frequency setting to be at 50Hz and adjust in increments of 1Hz till required coal feed rate is achieved			
7	Record coal feed rate per frequency adjustment			
8	Record length of stroke per adjustment Note that the feeder should operate at 9.8mm stroke to achieve feed rate of 1600/h			

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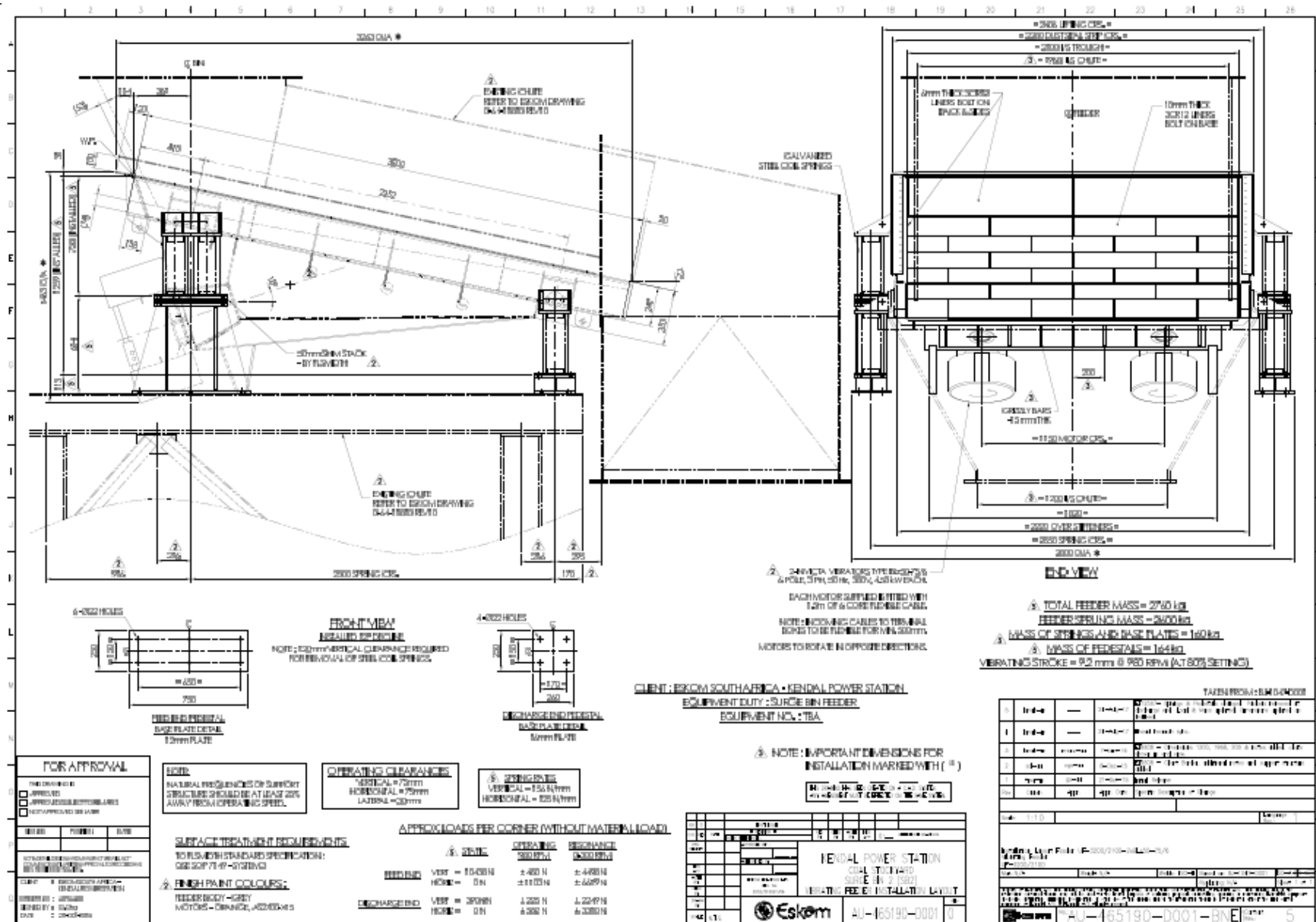
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Details of the vibrating feeder**CONTROLLED DISCLOSURE**

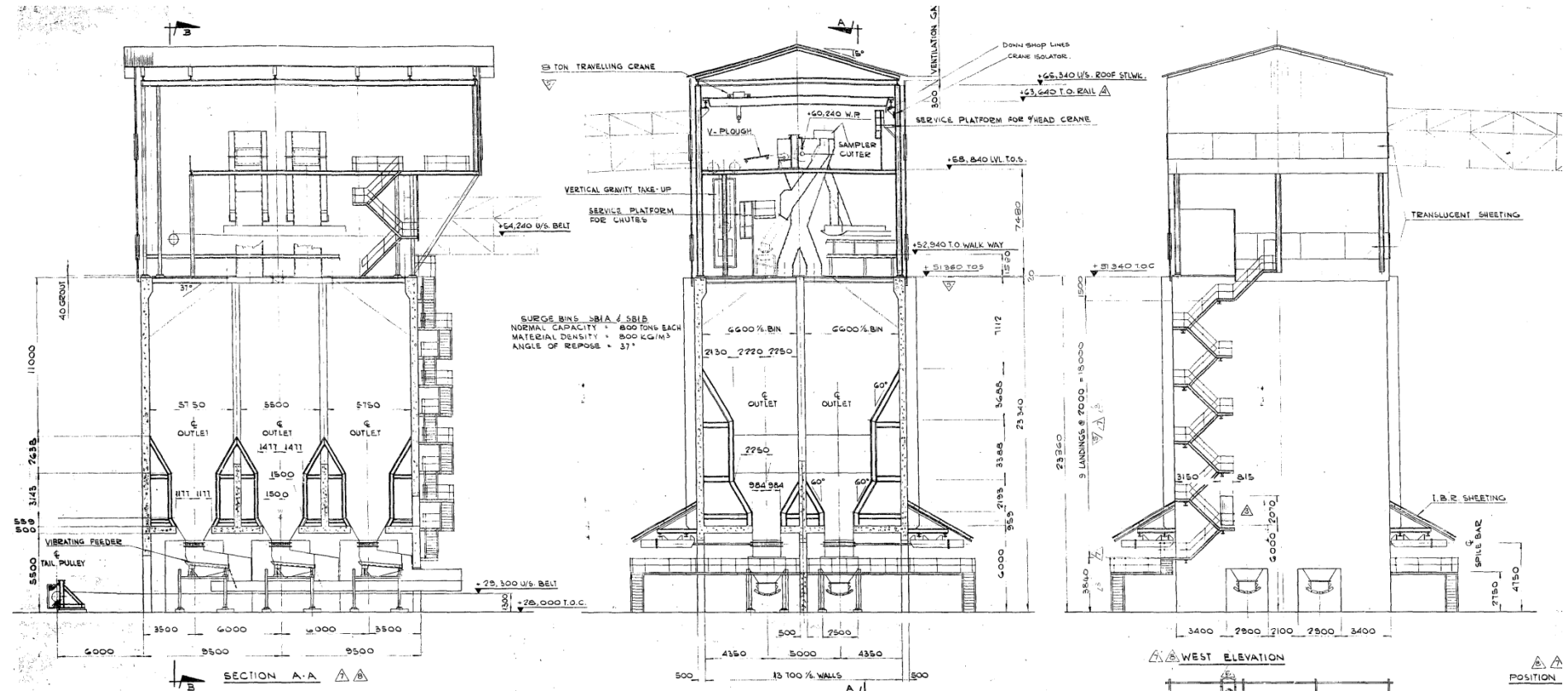
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Installation location

Surge bin 1 and 2



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5.3 Safety requirements

- Personnel undertaking work must ensure they are wearing the correct PPE.
- Steel Cap Safety Footwear
- Protective Eyewear - safety glasses, over-glasses or prescription safety glasses
- High visibility shirt or vest to be worn
- All clothing to consist of long pants and long sleeve shirts
- Hearing protection
- Gloves
- Note that additional PPE may be required

Additional safety requirements

- Note that the conveyor underneath will be running, scaffolding should be erected to prevent personnel from falling into conveyor
- Toolbox talk to be shared daily
- The supplier is expected to comply to the following documents when working at/rendering a service to Eskom but not limited to the following:
- The contractor is expected to comply with Health and Safety requirements standards 32-136
- The contractor shall comply with Occupational Health and Safety Act 85 of 1993
- The contractor shall comply with Mine Health and Safety Act (where applicable)
- The contractor shall comply with National Environmental Management Act 107 of 1998
- Note: it is your company's responsibility to fully align the company's processes to Eskom's SHE requirements (policies, procedures, standards etc).

5.4 Scope Variations

None

5.5 Skills required

- Qualified riggers
- Qualified artisan
- Safety officer
- Qualified specialist to perform tests on the feeder i.e. from FLSmidth

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5.6 Tools and equipment requirements

Contractor to have suitable tools

5.7 Preservation requirements

N/A

5.8 Transportation Requirements

N/A

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6. Acceptance

This document has been seen and accepted by:

Name	Designation
Kamogelo Lefifi	Project Manager
Takalani Thovhakale	Project Leader
Thando Gxota	Aux Engineering Manager (Act)
Sazi Jele	Snr Auxiliary Engineer

7. Revisions

Date	Rev.	Compiler	Remarks
January 2021	N/A	S Malgas	SOW

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