

Memorandum

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| To | Reentseng Molapo Chakala Mphafi | From | Rudolf van Wyk Reginald Barry Enoch Lottering |
| Copy | Ramachaha Hlajoane Lebakeng Phooko | Reference | 1003061 |
| Date | 2023-09-21 | Pages (including this page) | 3 |
| Subject | Employer's Requirements Memorandum | | |

This memorandum documents the Employer's requirements for the trash rack cleaning machine (TRCM) required for the Matsoku Weir to provide for better debris management and operation of the Matsoku Weir.

1 Employer's Requirements

- (a) Operation of the equipment shall ensure a safe operational procedure and not expose the operational staff to unsafe operational practices. Protections shall be in place to ensure that the local community shall be restricted from access to the machine. This shall include an audible (siren) and visual (lights) warnings before the machine starts and during the machine's operation. The TRCM solution shall adhere to the Lesotho Labour Code Order No24 of 1992. The South African OSH Act No 85 of 1993 shall be used as a best practice supplemental guideline wherever the Labour Code lacks.
- (b) The TRCM shall provide for the following control functions:
 - i Automatic control is not mandatory but can be offered by the TRCM Contractor and shall be priced separately. In automatic operation the TRCM shall perform a cleaning cycle at a pre-programmed frequency without the need for human intervention.
 - ii Semi-automatic control is not mandatory but can be offered by the TRCM Contractor and shall be priced separately. In semi-automatic operation the TRCM shall perform a complete cleaning cycle at the start of a push button and shall provide for cleaning specific screen bays as selected by the operator on the HMI.
 - iii Manual control: The operator shall be able to manually operate the TRCM using a pendant control or from an operator control panel with critical protections hard-wired to avoid damage to the screens, structure or TRCM.
 - iv Operator intervention: The TRCM shall an emergency stop function.
 - v Remote monitoring: The TRCM shall provide for remote (off-site) monitoring and diagnostics of the machine. Remote control on the TRCM shall not be possible or shall be prohibited.
 - vi Access to the control system for remote monitoring and HMI functions shall be password protected and may only be granted by the assigned LHDA Administrator.
 - vii The TRCM shall be remotely monitored by radio telemetry. The TRCM Contractor shall provide open protocol communication to a telemetry system to be provide by the others.

- (c) The TRCM shall be robust and fit-for-purpose for the Matsoku weir site with a minimum operational life of 20 years. No major replacement of structural and/or electrical and control systems should be required for a period of 20 years. Replacement of consumable spares will be acceptable, but the consumable spares shall be identified in the offer of the Contractor.
- (d) The TRCM operation shall not cause damage to the weir structures, trash rack screens, or unintended lifting of the screens and damage to the TRCM itself in automatic, semi-automatic and manual modes, whichever is applicable.
- (e) The TRCM shall be allow operators to manually remove and insert the screens when required. The claw may be replaced with a fitting suitable for the purpose of removing and inserting the screens.
- (f) The TRCM shall have a noise level of less than 81 dB(A) at a radius of 1 meter from the acoustical centre on the TRCM.
- (g) The TRCM shall not cause oil pollution of the river or the surrounding areas.
- (h) The general maintenance and replacement of key parts can be independently performed by the LHDA's operations and maintenance team based on training provided by the TRCM Contractor. A list of critical and long lead item spares that are not available in Lesotho or South Africa shall be provided by the TRCM Contractor. Any special tools, including non-metric tools, for undertaking maintenance on the TRCM or for replacing parts that are not available in Lesotho or South Africa shall be provided by the TRCM Contractor.
- (i) The TRCM shall provide for dealing with large logs of up to 6 m in length and weighing up to 2 tons. The TRCM shall also provide for manual manoeuvring of oversized debris (i.e. logs longer and heavier than 6 m and 2 tons) away from the screens (using alternative claws or hooks or otherwise) and towards the weir crest without having to lift it and to enable discharge over the spillway. The machine shall provide for overload protection and will alert staff and remote monitoring through audible (alarm) and visual (lights) warnings when an overload has been detected.
- (j) The TRCM shall enable removing debris from the screens and the dumping of debris into the waste skip (to be provided by others) and the laying down of large debris (such as tree logs up to 2 tons) on the concrete slab adjacent to the skip area.
- (k) The TRCM shall be designed for a 400 Volts, 50 Hz power supply and shall adhere to SANS 10142.
- (l) The TRCM shall be designed for the site altitude of 2100 m above sea level, a maximum ambient temperature of 35 °C and a minimum ambient temperature of up to -15 °C.
- (m) The TRCM shall have sufficient lightning protection and shall be connected to the earthing system installed at the weir. The TRCM Contractor shall specify the earthing requirements for the lightning protection in his submission.
- (n) The operation and maintenance manuals, including drawings of the TRCM, necessary for the operation, maintenance and replacement of key parts shall be provided by the TRCM Contractor.
- (o) The TRCM Contractor shall provide sufficient training to the LHDA to enable the LHDA's operators to operate and maintain the TRCM. This shall include the replacement of key parts.
- (p) The TRCM shall undergo factory acceptance testing (FAT) and the FAT shall be witnessed by the LHDA and the Consultant prior to shipping to site.
- (q) The TRCM shall be commissioned by the TRCM Contractor and a commissioning report and as-built drawings will be submittal for approval by the Consultant.
- (r) The TRCM Contractor shall allow for an 18-month warranty over and above a 12-month defects notification period following practical completion of the Works,

These Employer's Requirements shall form the basis of the request for tender (RFQ) document and the performance specification shall be developed to ensure that the TRCM satisfies the Employer's requirements.

2 Approvals

These Employer's Requirements shall form the basis of the request for tender (RFQ) document and the performance specification and reference design shall ensure that the TRCM offered by potential TRCM Contractors satisfies the Employer's requirements.

Yours sincerely

Rudolf van Wyk
Technical Director – Dams and Hydropower Lead

I, **Ramachaha Hlajoane**, duly appointed representative of the LHDA, approve the Employer's requirements for the TRCM as documented in this memorandum.

Signed on this **22** day of **September** 2023

Name: **Ramachaha Hlajoane**

Signature: 
For and on behalf of LHDA

