
Executive Summary

A comprehensive review of the methods currently employed by DSD Term Contractors in desilting tidal box culverts is covered under R&D Report No. 1032 entitled “Review of Methods of Cleansing Box Culverts”. The objective of this study is to carry out site trials, with active participation of Mainland South Division (MSD) staff and their Term Contractor, on developing innovative and cost-effective non-man-entry desilting methods for adoption in future Term Contracts.

The feasibility of the following desilting methods was investigated and wherever practical, site trials were carried out to demonstrate practicality and cost effectiveness:

- High Flow Method
- Remotely Operated Cleaning Machine (ROCM) – site trial not performed
- Weda Cleaner VR-600
- Sludge Pump with Desander

The essence of the site trial on High Flow Method involved high flow water jetting for loosening up and breaking down of hardened silt deposits and subsequent flushing to downstream opening/outlet for grabbing and disposal. Drying of the highly fluid muck by gravity draining and evaporation required a long time which caused environmental concerns and is not considered effective/efficient.

ROCM is not tested due to the prohibitive high cost.

The Weda Cleaner VR-600 uses a remote-operated, submersible vehicle to clean and inspect tidal culverts without dewatering or using divers. The brush heads and its submersible pump remove silts and discharge waste to an appropriate location for disposal. However, the high liquidity of the discharge itself rendered this method inefficient, let alone the small size of the machine which cannot crawl on the silt/sludge which is usually 500mm to 1 metre in depth, coupled with the ineffective agitation of the silt/sludge and the ineffective sucking point at the bottom of the machine.

Sludge Pump with Desander - Sludge located at the opening of a box culvert is removed by a sludge pump. The extracted sludge is dewatered through a desander while the separated water would be discharged back to the culvert. The spatial requirement for the system set-up allows this operation to be carried out in normal working hours, thus reducing nuisance to the public as well as avoiding additional night work costs.

Way Forward

In view of the above findings, it is considered worthwhile to further pursue on the Sludge Pump with Desander method on a larger scale at different sites to ascertain and master the technique if we are to seriously consider adoption of similar methods that are available in the market.

More importantly, it is recommended that appropriate allowance in the Schedule of Rates of future Term Contracts for bidders to introduce proven innovative and cost-effective desilting methods such that contractors will not be reluctant to come up with practical solutions. Alternatively, consideration could be given to letting a separate contract on desilting box culverts and stormwater drains with a tender assessment using marking scheme giving due weight for innovation ideas on the methodology.