

# REMOTE CONTROLLED CULVERT CLEANERS - CASE STUDY BOUNDARY ROAD COOPERS PLAINS



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# REMOTE CONTROLLED CULVERT CLEANERS - CASE STUDY BOUNDARY ROAD COOPERS PLAINS

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## ABSTRACT

To present a case study on a recent project to clean a 3.5m wide x 2.1m high x 190 metre long culvert 50% blocked with debris. This created a weir for the upstream lines flowing into the culvert and caused local flooding on a major road during heavy storm events.

The estimated volume of debris to be removed was 340 tonnes and the Microtraxx unit was an obvious choice to carry out the work without the need to use water.

The Microtraxx remote controlled culvert cleaner with a consistent bucket load capacity of 280kg was used to haul back the debris to the culvert headwall where an excavator/ tipper truck removed the debris. The vacuum loader was used to suck out the debris stockpiled at the access hole. As there was no water used the product remained spade able and could be transported and disposed of at landfill at a quarter of the cost of conventional methods.

The site was further complicated as the culvert ran under both the Queensland Rail and Aurizon rail corridors which was a challenge gaining access. Detailed project management documents were required to be approved by three separate entities prior to commencing.

The project was delivered 15k under budget and the actual volume of debris removed was 387 tonnes.

The Environmental significance of this method cannot be understated. By not having to use water which is the traditional method of drain cleaning these structures millions of litres of water was saved and the cost of transport and disposal heavily reduced.



**Figure 1 :** *Map of the Site.*

## 1.0 INTRODUCTION

This project was originally discussed with Brisbane City Council who had engaged PMA to utilise the Microtraxx culvert cleaners on several previous occasions after the 2013 Brisbane floods.

During rain events the silted culvert at Boundary Rd caused localised flooding in the area and Council contacted Pipe Management Australia in an effort to come up with a cost effective solution for cleaning the culvert. The structure also encroached on both the Queensland Rail and The Aurizon Rail Corridors. Specific project management documents were developed by PMA and submitted and approval obtained before we were able to proceed. The culvert was estimated to contain 340 tonnes of debris which contained an amount of entrained water.



**Figure 2:**      *Culvert Headwall.*

## 2.0 DISCUSSION

In order to remove the debris as cost effectively as possible it was decided to remove as much water as possible in the structure. This was achieved by:

- Installing a 100mm trash pump used initially to remove the ponded water at the headwall which was discharged through a filtration system downstream.
- From there a sump was created at the low point where a 50mm flexdrive pump was installed to remove as much water as possible before commencing removal of the debris with the Microtraxx.
- As the outlet was overgrown slashing was undertaken to gain access (figure 3 below)
- Figure 4 below shows the outlet after slashing
- A ramp to the culvert was then constructed allowing access to the culvert (see figure 5).



**Figure 3:** *Overgrown Headwall.*



**Figure 4:** *Headwall after Slashing.*



**Figure 5:** *Access Ramp.*



**Figure 6:** *Microtraxx Hauling Back Debris.*

- The Microtraxx culvert cleaner was then used to remove the debris (see figure 6). The debris was removed in two ways:
  - a) Sucked up by a vacuum loader, through the access hole cut in the culvert roof, 50 metres from the headwall, removed from site and disposed of at a local landfill.
  - b) Stockpiled by the Microtraxx at the headwall and removed using an excavator and tip truck then disposed of at landfill.
  
- The access pit was dug using Non Destructive Digging techniques on the other side of the rail corridor to reduce the distance travelled by the Microtraxx by some 50 metres. A hole was cut in the concrete roof of the culvert to allow the vacuum loader in (a) above to suck the debris stockpiled in the culvert at this point. This hole was then converted into a field drain for future access and to prevent the possibility of future flooding in the street (see figure 7).



**Figure 7:** *An Access Hole Cut in the Culvert Roof During Cleaning was Converted to a Field Drain for Future Access.*



**Figure 8:** *Showing the Site During Cleaning and Access Ramp.*



**Figure 9:** *Equipment used on site Microtraxx and Drain cleaner/vacuum truck.*

### **3.0 CONCLUSION**

- The project was completed on time and \$15k under budget.
- The Microtraxx solution was \$95k cheaper than the alternative conventional methods offered by competitors.
- Actual volume of debris removed was 387 tonnes.
- Project length was 2 weeks compared to 6 weeks quoted by competitors.
- Traditional methods of drain cleaning would have required some 2 million litres plus of water to remove this volume of debris as well as substantially increasing the costs of transport and disposal of the liquid slurry.
- Microtraxx Remote Controlled Culvert Cleaners present an environmentally sustainable alternative to traditional methods of cleaning drains above 1200mm diameter and culverts larger than 900mm square because they require no water to remove the debris.

### **4.0 ACKNOWLEDGEMENTS**

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