



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5

# Roll-open Lid

SA Patent 2012/03959

Owing to attacks on the pressure reducing valve at the Deduza reservoir the council placed an upside down culvert over the valve chamber's manhole (see fig 1). However this meant that a front end loader was required to remove the culvert anytime access into the valve chamber was required. The culvert system is also vulnerable to a truck pulling the culvert off with a chain, or it can be pushed off if rollers are inserted below using a crowbar.

To solve this problem a roll-open lid was installed – see fig 2, where the lid is shown in its closed and locked position. The first step to opening the lid is to remove the plug in the 'access tube' using an 'opening tool' – see fig 3. More specifically the plug is lifted out by the magnet attached to the front of the opening tool – see fig 4. With the plug removed, the opening tool is inserted through the access tube (see fig 5), whereupon its pinion engages the rack-levers underneath the lid – see fig 6.

The lid may now be rolled open, and these sequences are shown in fig 8 through fig 10. The radius (about which the lid turns) and upright panel (counterbalance panel) are designed such that rolling the lid open/closed requires minimal effort – it can be done with just one hand – even though lids typically weigh in the region of 500kg/1000kg. The lid is stable throughout the rolling process and will stop and stay in any position if let go.

Fig 11 is a view of the open lid from above. It is evident that the underside of the lid has a protrusion that is made to go some way into the manhole. This prevents the lid from being pulled or pushed off the valve chamber (when in the closed position).

Fig 12 is a close up of the locking mechanism, with the pinion of the opening tool engaging the teeth of the rack-levers. It may be observed that there is a spline-plate behind the rack-levers, through which the opening tool's pinion must pass en-route to the rack-levers. This plate is in effect the keyhole for the pinion, which is in effect the 'key'. It is evident that the pinion & spline-plate may have more or fewer teeth, and that the teeth may be longer or shorter, or thinner or fatter. The pinion and spline-plate may therefore be customised – where literally hundreds of combinations are possible.

Fig 13 is a view of a roll-open lid in its fully closed and locked configuration installed at Badfontien for the Limpopo Department of Agriculture.

**Advantages** include (a) simple retrofitting to any size manhole, (b) safe operation, (c) extreme protection, (d) and fast unlocking and (e) easy operation.

Manufactured & installed by Dams for Africa. Contact details: [nicholas@damsforafrica.com](mailto:nicholas@damsforafrica.com) mobile +2782 416 8958, tel +2711 475 8381/2764

*This lid may be made to any size depending on the size of the manhole. Other models for lids are possible and include a screw-up version, a slide-open version, or a lift-out-by-hand version for smaller lids. Further products in our range include various sliding concrete doors (for pump stations & sub-stations), various vaults for boreholes, transformers & stand alone control panels, see [www.damsforafrica.com](http://www.damsforafrica.com). All products have robust locking mechanisms, and can be made to any size, all from 60MPa concrete with up to 5% reinforcing for extreme protection.*

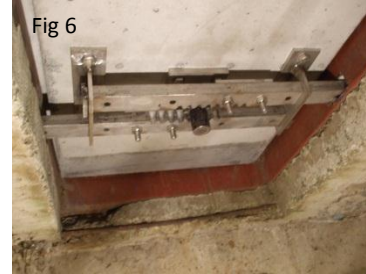


Fig 6



Fig 7



Fig 8



Fig 13



Fig 12



Fig 11



Fig 10



Fig 9