‘Borehole Vault’

SA Patent 2012/08045
& SA Patent application 2015/07179 (Lock & key assembly)

‘protecting submersible pumps’

The ‘Borehole Vault’ is manufactured and installed by Concrete Doors and Vaults (Pty) Ltd. Please direct enquiries to Dr Nicholas Papenfus at nicholas@damsforafrica.com, or 011 472 1520/8, or 082 416 8958.


Fig 1

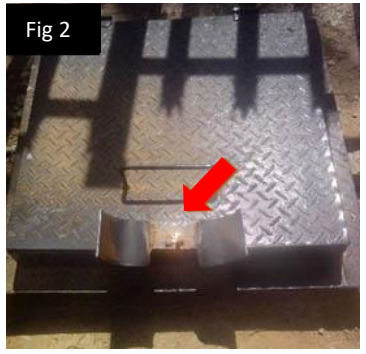
Fig 2


Fig 3


Fig 4

Fig 1 shows a newly installed Borehole Vault, consisting of an outer shell and a central lid, made from 60MPa concrete, and weighing 1.4 tons. These vaults are replacing steel ‘box & lid’ chambers that are currently being vandalised, see fig 2.

The installation process takes about two hours and consists of excavating to 200mm below NGL, compacting, levelling (see fig 3) and then lowering the vault into position (see fig 4). There is no need to disconnect the pipe and electrical cables as the vault’s ‘tunnel’ goes over them (see arrow).

The unlocking / opening sequence consists of :

a) Lifting out the ‘plug’ from the central ‘access tube’ using the key assembly’s magnet (fig 5) and this brings the ‘lock’ into view, situated further down the access tube, see fig 6.
b) Unlocking and lifting out the multiple-lever lock (see fig 7) using the key assembly. A plate with a gear shaped opening comes into view at the bottom of the access tube (fig 8).
c) Inserting the ‘opening tool’ into the access tube (fig 9). Its gear shaped pinion passes through the matching gear-plate until it engages the locking mechanism below.
d) Lifting out the lid, see fig 10 and fig 11.

The interior of the concrete shell easily accommodates the internal pipe work, valves, and electrical controls (see fig 12).

The lid has four layers of Y12 reinforcing, see fig 13, that are too closely spaced for a chisel to pass. (Same for the shell).

Fig 14 shows the levers of the locking mechanism in their retracted position (for opening) while fig 15 shows them extended (locked position).

Fig 16 is an ‘exploded’ cross section through the vault, showing the lid & opening tool raised above the shell.

A variety of other concrete products such as doors and lockable lids also offer extreme protection to for example valve chambers, sub-stations, stand alone control panels, etc. These products may be viewed at www.concretedoorsandvaults.com.


Fig 5


Fig 6


Fig 7


Fig 8


Fig 9


Fig 10


Fig 11


Fig 12


Fig 13


Fig 14


Fig 15

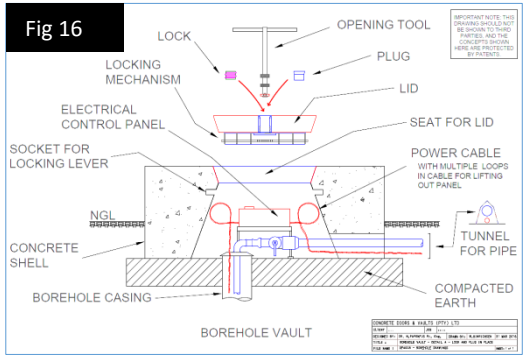

Fig 16