

Screw-lid Vault

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Manufactured by Dams for Africa (Pty) Ltd. Installation can be done by client or Dams for Africa.
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Following repeated hits by vandals in 2009 on two remote boreholes in Limpopo, LSM Leshika Consulting Engineers specified the 'screw-lid vault', made from 60 MPa reinforced concrete. Subsequent attempts to breach the installations have not succeeded.

The operation of the vault is described in figures 1 through 10:

Fig 1: The 'screw-lid vault' in its locked configuration. Essentially it is an elongated box. The walls are recessed (see fig 7) to support a lid, and also have U bars protruding beneath to anchor into the floor slab – which is cast after the walls have been positioned and levelled. A steel channel as indicated in the picture is padlocked to lugs protruding above the walls – this may be regarded as the first level of protection (optional).

Fig 2: Only after the channel is removed does an 'access tube', sealed by a steel 'plug', come into view. This plug may be regarded as the second level of protection (also optional). Both plug and access tube are made from stainless steel to ensure they do not rust solid. The plug is lifted out by a magnet, rendering the access tube open.

Fig 3: The third and essential level of protection is the opening tool. It consists of a handle attached to a threaded bar, which is inserted into the access tube. Upon engaging a nut at the base of the lid (see inset) that has a matching thread, the tool is turned and steadily moves downwards. The thread of the tool may be customised by varying its diameter, pitch, and shape. This affords upwards of 100 different combinations - an effective 'key'.

Fig 4: With continued turning the lid begins to lift out of the walls – this happens after the opening tool reaches the bottom of the 'guide tube' in the 'bridge' (see figure 7).

Fig 5: With further turning of the opening tool the lid is lifted above the walls.

Fig 6: The lid may now be rotated – this operation can be done in seconds and requires minimal effort.

Fig 7: The lid, supported by the opening tool, has been turned through 90 degrees. The tool is held vertical by the 'guide tube' in the 'bridge'. The bridge transfers the weight of the lid to the walls. With the lid in this position there is access to the vault on either side of the lid, if for example a valve needs to be opened/closed, or a meter reading must be taken. Thereafter the lid may be closed by reversing the steps described above.

Fig 8: However, if a more substantial task must be undertaken, such as removing the pump, or replacing a pipe, then the opening tool must be turned in the opposite direction until the weight of the lid has been transferred to the rails via the two sets of wheels attached beneath the lid. Upon continued turning the tool will exit the guide tube. Now the lid may be pushed to either end of the vault.

Figure 9: The lid has been pushed to one end of the vault.

Figure 10: With the lid pushed back, there is sufficient space to perform major maintenance tasks. Note that the bridge is in position, but may also be unbolted and removed if more working space is required.

This vault may be made to any size. Larger versions may house surface pumps. For other vaults and other anti-vandalism/theft products in our range see www.damsforafrica.com which variously protect valves, pumps, boreholes, instruments, control panels, transformers, pump & sub stations etc. All products have robust locking mechanisms, can be made to any size, all from 60MPa concrete with up to 5% reinforcing for extreme protection.

