Double 'L Door'

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Fig 1

Fig 2

Fig 3

Fig 4

Pump stations that convey water to municipal areas cannot afford to go offline for more than a few hours. It is therefore essential that equipment such as electrical control panels/cables, motors, pumps, valves, brass fittings (see fig 2) as well as standby generators (see fig 3) are protected. Pump stations should therefore ideally be designed with (a) reinforced concrete roofs (b) 250mm reinforced concrete walls, (c) no windows, but rather 100mm diameter ventilation holes, and (d) 60MPa reinforced concrete doors (see fig 1). (Concrete doors are immune to oxy-acetylene attack, and are too thick for angle grinders to penetrate, and dense reinforcing is provided to withstand chisel attack).

Concrete doors typically vary in weight from 900kg through 2500kg depending on size. In this respect they are potentially lethal should they fall over. A concrete door consisting of a single panel on hinges would run the risk of overturning – if for example the hinges fail; or if the fastening bolts fail or pull out of the wall. Perhaps the most dangerous period occurs during the initial installation of the door.

To prevent overturning concrete doors should substantially have a three dimensional aspect to their design. This may be achieved by adding a 'stabilizing panel' to the back of the main panel (see fig 8). Such doors may appropriately be called 'L doors', and for large doorways two L doors may be used to limit individual weights. Secondly, these doors should not be attached to the walls, but rather roll on tracks in the floor (see figs 3, 8, 9). Thus any weakness in the wall/bricks/mortar does not impact on the safety /stability of the door.

Opening sequence: Fig 4 shows the fully locked L doors. The first locking device (optional) is a 'locking channel' that is attached to a pair of screw-in lugs, one in each door (see bottom inset). The channel has two slots at the back to receive the lugs. Thereafter padlocks are attached to the lugs (see top inset). To open the door the padlocks are removed, the channel is pulled free from the lugs, and finally, the lugs themselves are screwed out of the door.

(However, please note that this system is no longer used – the channels are too heavy and awkward. Instead use is made of a plug that slides inside the 'access tube', and which is removed by a magnet – see brochure on 'platform door').

With the channel (or plug) removed the access tube is open – see fig 5. An opening tool, which has a pinion at its front end, is inserted into the 'access -tube'. The pinion passes through a matching 'spline-disc' attached to the far end of the access tube , and then on to engage a 'rack-bar' – see fig 6. In effect the pinion is the 'key' while the 'spline-plate' is the 'key-hole'. The rack-bar runs in a guide-tube (see fig 7) which is fastened to the back of the door. When the door is in the closed position, the guide tube will be directly above an 'anchor-hole' in the floor, and the rack-bar will be inside this hole.

By turning the handle of the opening tool, the rack-bar will slide upwards and exit the anchor-hole, rendering the door unlocked. The door may now be pushed open, conveniently holding on the tool's handle as a pushing point – the rack-bar has a small wheel beneath it that supports it during the sliding operation..

Note that a variety of other door designs are also available, depending on the application – see www.concretedoorsandvaults.com. Further products in our range include various concrete lids (for valve chambers), and various vaults with slidable/liftable members (for protection of transformers, borehole installations, stand alone control panels, etc). Products can be made to any size, all from 60MPa and heavily reinforced..

Fig 5

Fig 6

Fig 7

Fig 8

Fig 9