

Vanstone Precast (Pty) Ltd

REINFORCED CONCRETE ROUND DROP-IN MANHOLE COVER TYPE 2A
580mm dia x 150mm Thick

STRENGTH TEST IN ACCORDANCE WITH SANS 50124

Date of Test 9 April 2019

Design

The Cover was designed to comply with SANS 50124 for class D400 (400kN load) on a 250mm diameter test block in the centre of the Cover. This load class falls within group 4 of the code and includes "Carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles."

The Cover is specially configured to serve as a "drop-in" replacement cover where cast-iron covers have been removed from old type 2A cast iron frames. It sits flush with the top of the frame or road surface and does not protrude at all.

The size of the Cover is 580mm diameter x 150mm thick extreme. It is made of reinforced concrete that is cast inside a sheet steel dish with a 20 x 20mm steel ring as a top rim.

As little as possible of steel is visible.

Test Procedure

1. The Test Cover was placed in a standard Type 2A cast iron frame as shown in Figure 1. The frame supported the Cover evenly all around.
2. A softboard buffer was placed between the Cover and the test block.
3. The test block is a steel cylinder of 250mm diameter x 100mm thick.
4. The load was gradually applied until a system hydraulic pressure of 648 Bar was reached. This corresponds to a force of 400kN.
5. At this stage no effects were visible. The load was removed and the Cover inspected. There appeared to be no loss of connection between the concrete, steel ring, steel dish and reinforcing steel. Neither the concrete nor the steel showed any signs of failure. A small hairline crack between the steel ring and the concrete indicated some relative movement during stressing. The crack closed again after the load was removed.



*Figure 1: Testing of Prototype Reinforced Concrete Drop-in Cover Type 2A.
Note the Standard cast-iron type 2A frame.*

Comment

The load cell on the test press was calibrated to 1250 bar or 779kN and the result is reliable.

Conclusion

1. The Cover passed the SANS 50124 Strength Test for load class D400.
2. There was minor separation between the concrete and steel ring, which does not amount to failure.

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