Manhole installation guide

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CPM Concrete Drainage Systems

Manhole Installation Guide

DN900 - 3000

Version 1.1
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1.0 Introduction

CPM Group Ltd concrete manholes are designed, manufactured and kitemarked to BS EN 1917 and BS5911-3. The intended use is to permit access and to allow aeration of drain or sewer systems conveying sewage or surface water under gravity.

When correctly installed the manhole units are designed to withstand main road traffic loading. For further details of the specification and performance criteria please contact CPM Group Technical Department.

Please note this is a general guide and reference to drawings and specification should be made for any particular requirements.

2.0 Preparatory Considerations

- For the excavation work required prior to manhole construction a mechanical excavator is normally required. The type is dependant on the manhole diameter and weight (see table at foot of page).

- For manhole rings up to and including DN1200, a backhoe type excavator with a 1T lift capacity is generally adequate. For larger rings and slabs a 360^{o} slew machine will be required.

- The bucket of the excavator being used should be fitted with an approved lifting point to which the chains or webbing sling can be attached. **DO NOT USE MAKESHIFT LIFTING ARRANGEMENTS.**

3.0 Off Loading

Chamber sections should be delivered vertically on the lorry. Proprietary lifting bolts are required (available from your supplier) which fit through the 50mm diameter holes in the chamber units. Units up to and including DN1800 have 2 holes, larger diameters have 3 holes. Chains should be fitted through from the inside of the chamber unit.

Cover slabs have 3 lifting points around the outer rim of the slab requiring chains with hooks.

IT IS ESSENTIAL FOR THE LIFTING CHAINS OR SLINGS TO HAVE A SAFE WORKING LOAD AND SUITABLE ANGLE OF LIFT APPROPRIATE FOR THE UNIT BEING LIFTED.

DN	Chamber unit Weight (Kg's) /m Depth	Cover Slab Weight (Kg's) 675^2 access
900	530	130
1050	710	235
1200	912	355
1350	1080	475
1500	1330	790
1800	1760	1210
2100	2140	1745
2400	2740	2375
2700	3400	3335
3000	4140	4585

4.0 Construction

Manhole Bases are generally cast insitu and placing of the first chamber unit will be dependant on the particular detail required by the design.

However, it will generally be one of the following 2 types.

(a) Insitu base built to incorporate the main pipes (Sewers for Adoption typical details).

The insitu base should be taken to a minimum of 50mm above the highest pipe. The ring should be lowered onto the concrete, levelled and additional concrete placed to build the ring in a minimum of 75mm.

(b) Insitu base slab.

The first ring can be placed directly onto a cast base slab. The ring should be placed on 2 layers of bitumen sealant (see table) or on a 10mm thick 3:1 sand/cement mortar bed. Inlets, outlets and benching will then have to be formed.

The manhole can then be constructed to the required height. The joints should be made with either sealant as shown in the following table or a 3:1 sand/cement mortar. Reference to the specification should be made to confirm particular requirements for the joints.

Joint Sealant

Sealant size (tongue and groove joints)	12mm x 60mm		12mm x 80mm				12mm x 120mm			
Unit nom. Size (mm)	900	1050	1200	1350	1500	1800	2100	2400	2700	3000
Sealant length (per joint)	3.5m	4.0m	4.5m	5.0m	5.5m	6.5m	7.5m	8.5m	9.5m	10.5m
Primer	5 litres / 100m		5 litres / 75m				5 litres / 50m			

The cover slab is seated on 1 layer of sealant for manholes up to DN1200 and 2 layers for larger diameters.

Some specifications may require a 150mm concrete surround to the manhole. Proprietary shutters are available for this should it be required.

The manhole can then be completed to ground level by using either class B engineering bricks or precast concrete adjusting units with the access cover and frame finally seated at ground level.

5.0 Units with pre-formed cases

Products such as bespoke manhole units and catchpits with preformed bases can be laid on a minimum 150mm pipe bedding material unless other wise specified in the contract.

The outlet pipe is laid to its correct level as far as the butt pipe which is connected into the chamber wall.

The unit with the butt pipe is jointed onto the pipeline.

Once installed, the unit should be checked for level. The unit is backfilled with pipe bedding to 150mm over the pipes after which suitable backfill can be used unless the contract requires otherwise.

If required benching can be completed at this stage or after the chamber has been built and backfilled.

The units are then completed as a standard manhole.

Scotland Sales and Works
CPM Group Ltd, 101 Main Street, Newmains, Wishaw,
Lanarkshire, ML2 9BG
Tel: 01698 386922 Fax: 01698 387167

Pollington Works
CPM Group Ltd, Pollington, Goole,
East Riding of Yorkshire, DN14 0DU
Tel: 01405 860591 Fax: 01405 863606

Leek Sales and Works
CPM Group Ltd, Barnfields, Leek,
Staffordshire, ST13 5QG
Tel: 01538 380500 Fax: 01538 380510

Technical Offices
CPM Group Ltd, CPM House, Heath Mill Road, Wombourne,
Wolverhampton, West Midlands WV5 8AP
Tel: 01902 356220 Fax: 01902 356221

Head Office Sales and Works
CPM Group Ltd, Mells Road, Mells, Nr Frome,
Somerset, BA11 3PD
Tel: 01179 812791 Fax: 01179 814511

sales@cpm-group.com

www.cpm-group.com