

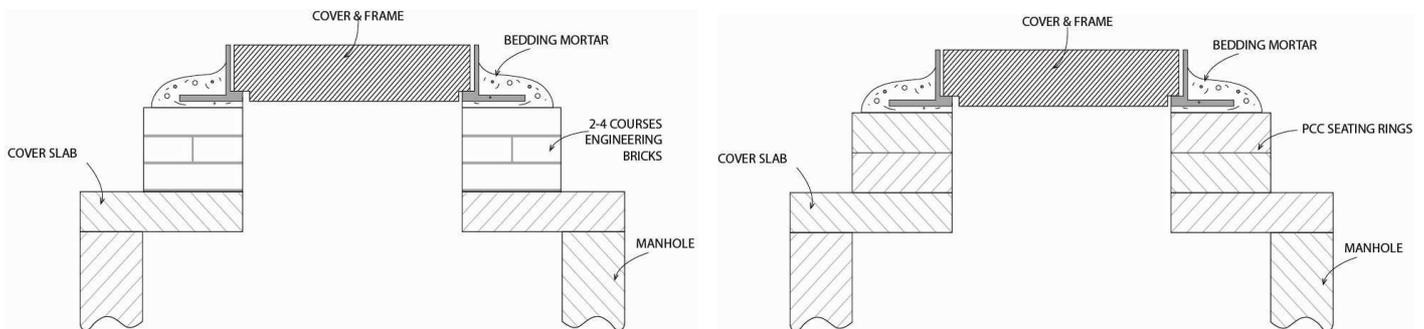
Clark-Drain D400 Ductile Iron Manhole Cover & Gully Grate Installation Guidelines

General advice:

1. Before commencing works, ensure that the correct Clark-Drain product has been chosen in terms of:
 - a. Clear-Opening size (measure *before* ordering)
 - b. Depth
 - c. Loading class
 - d. Specification (normal, Highway or High-Max specification)
2. Manhole cover and gully grate replacement/installation should only be attempted by qualified and experienced contractors. If in doubt, seek advice.
3. The placement of manhole covers and gully grates directly onto a concrete 'biscuit' (i.e. without bedding mortar) is not recommended.
4. Exposed ironworks are vulnerable to damage by vehicles so should be protected at all times and not trafficked until such time as the final road course has been laid.
5. Please note that the bitumen painted coating used on all Clark-Drain ductile iron products is a temporary coating only and is intended to wear off quickly once the product is being trafficked. Any surface oxidization of the iron that occurs has no detrimental effect upon the product's strength or its performance in service.

For New Installations:

Ensure the general work area is as clean as possible and free from debris. The manhole cover or gully grate frame should be placed on top of a layer of bedding mortar, which in turn is laid on top of 2-4 courses of engineering bricks or pre-cast concrete seating rings, as per the diagrams below:



The bedding layer material may be of a conventional mortar type, but for faster results mortar complying to HD27/04 (compressive strength of 20N/mm² within 2 hours) can be used, and for areas where extra strength is required (such as fast-moving or heavily trafficked roads) a thermosetting polymer resin based or cement based bedding mortar complying to HA104/09 (Tensile strength of >5N/mm² at 3 hours) should be used. In all cases mixing should be carried out mechanically to ensure a thorough and consistent mix, and it is highly recommended that mixed batches of mortar are no greater than can be used in the time before the material starts to set. Always follow the manufacturer's instructions when mixing mortar, taking note of any PPE required when handling (gloves, goggles, etc.). Please note that the performance of such bedding materials is severely affected if the mating surfaces are not clean and dry. Any unused mortar should be disposed of appropriately according to COSHH regulations.

The bedding material should be placed as soon as it is mixed, at a depth approximately 5-6mm greater than the required bedding thickness, and across the full width of the brick or concrete bedding area. The top surface of the mortar should be smooth and even, with no deep trowel marks.

The frame should then be placed as soon as possible, having been separated from its covers/grate and using mechanical lifting aids where appropriate, onto the bedding layer such that it is fully supported around the full perimeter of the frame flange and there are no voids at any point. The frame can then be tamped down to the required level, using surrounding road surfaces or other height markers as guides. Take care to ensure that the top edge of the frame is level with the intended final road surface, as failure to do so will result in excessive noise in service and/or potentially early failure of the manhole cover/gully grate. Ensure that bedding material is not obstructing the cover seatings, cleaning off excess material where needed.

Any holes in the frame flange should be filled with bedding material and the top face of the flange should be then covered in at least 10mm of the same. More may be added, if desired, to use up excess bedding material as long as it will not affect the placement of any subsequent surfacing courses. Clean up any exposed areas of bedding material on the *inside* of the frame by pointing to a smooth finish.

The covers/grate should not be placed into their frame until such time as the bedding has achieved full cure. When doing so, use mechanical lifting aids where appropriate. Surrounding surface courses can be laid only when the bedding has achieved full cure.

Do not allow the product to be trafficked in any way until the final tarmac road course is laid and cured. Failure to follow this advice could result in damage to the manhole cover/gully grate.

For Replacement Installations:

The recommended procedure for replacement is the same as for new installations, except that extra care should be taken after removal of the existing product to ensure that the remaining manhole chamber/gully top is clean, free of loose pieces/debris and is structurally sound. Any damaged, missing, or even suspect bricks should be replaced with matching new ones. A damaged concrete 'biscuit' may necessitate replacement of the full unit. Only when the chamber/gully top is confirmed as being in appropriately sound condition should the guidelines given above for new installations be followed to install the replacement manhole cover/gully grate.

This document is provided as guidance only – if in any doubt, consult an experienced professional contractor for further advice before commencing works.