

- 11 Class D400 units shall incorporate a permanent non-rock feature either triangular point suspension, machined faces or cushioned or wedged seating.
- 12 Bolts supplied for loosely coupling separate sections of covers and gratings shall be steel hexagon headed, complying with the requirement of IS EN ISO 4016, 4018 and 4034 and be galvanised in compliance with the requirements of the 1900 Series. They shall not be less than M16 complete with hexagon nut and shall be provided with means to prevent undue tightening of unit sections.
- 13 Not Used.
- 14 Requirements for special duty covers for use in carriageways shall be as described in Appendix 5/1.
- 15 Gratings for catchpit chambers shall have a minimum waterway area as described in Appendix 5/1.
- 16 Two sets of lifting keys shall be delivered to the Employer's Representative for each type of cover supplied. At least two keyways shall be provided in each complete cover, one in each segment for segmental covers. A recess for a prising bar shall be incorporated in manhole covers unless other means of loosening the cover from the frame are provided.
- 17 Frames for chamber covers and gratings shall be set in cement mortar designation (i) complying with Clause 2404 or a proprietary quick setting mortar of equivalent strength.

Covers and gratings located within the carriageway, hardshoulder or hardstrip shall be set in a mortar with the following properties:

- (i) The material shall be non-shrink;
- (ii) The material shall have a minimum workable life of 15 minutes;
- (iii) The compressive strength of the material shall exceed 30N/mm<sup>2</sup> in 3 hours;
- (iv) The tensile strength of the material shall exceed 5N/mm<sup>2</sup> in 3 hours;

- 18 For all pipelines except those constructed with corrugated pipes the nearest joint to any chamber shall be not more than 500 mm from the inner face of the wall and shall not be restricted by any concrete. Between this and the next joint, the length of the articulated pipe shall be in accordance with Table 5/6.

Table 5/6: Length of Articulated Pipe.

Nominal Pipe Diameter (mm)	Length of Pipe (mm)
450 and less	500 to 750
Greater than 450	750 to 1000

- 19 Where the adjustment or replacement of existing frames and covers or gratings is required, the units shall be taken up and refixed or replaced with new units complying with sub-Clauses 9 to 15 of this Clause, or such other specification as required by the authority responsible for the utility to which the cover provides access. The frames and covers or gratings shall be laid on a mortar bed complying with sub-Clause 17 of this Clause. The finished thickness of the mortar bed shall be between 10 mm and 25 mm. Unless otherwise described in Appendix 5/1 adjusted or replaced chamber frames and covers or gratings shall be set flush with the new surface. Any additional adjustments shall be by modifying the brickwork in compliance with sub-Clause 507.3 or by using a frame of a suitable depth.

## 508 Gullies and Pipe Junctions

- 1 Gullies shall be untrapped, unless otherwise described in Appendix 5/1, and be in accordance with the NRA Road Construction Details listed in Appendix 5/7.
- 2 Gullies shall be constructed so that no part of the spout or trap has a cross-sectional area less than 2/3rd that of the outlet. The depth of water seal in trapped gullies shall be not less than 50 mm.
- 3 Precast concrete gullies shall comply with BS 5911-6. In situ concrete gullies shall be constructed of mix ST4 concrete or concrete blockwork of 225mm minimum thickness and be as described in Appendix 5/1