For deformations exceeding the acceptable values the soil above and around the pipes shall be removed and measures approved by the Engineer shall be performed to rectify the deformation. A new test shall be performed after rectifying the deformation.

5.3.11 Manholes and Chambers

All chambers for valves etc. shall be constructed from precast units that are interlocking and comply with the requirements of TS EN 1917.

All inspection/tangential manholes shall be constructed from HDPE in accordance with TS EN 13598-2 and all terminal manholes for customer connections shall be constructed from reinforced concrete or precast concrete chambers in accordance with TS EN 1917. Stone-work or brick-work shall not be used. Unless otherwise indicated they shall be provided with a reinforced concrete cover slab and with a ductile iron cover and frame in a square, rectangular or circular opening in areas with traffic. The clear opening shall be a minimum of 600 mm diameter or square and the edges of the opening are to be chamfered. Covers are to be suitable for the anticipated loading in road minimum 40 tonnes (class D400) and in pavement minimum 12.5 tonnes (class B125) and are to comply with the provisions of CEN-standard EN 124 or equivalent Turkish Standard. They shall be set in mortar to be free from surface imperfections or blemishes.

Joints shall be made with sealing rings of vulcanized rubber; no other sealing material must be used.

Manholes on gravity sewers will have to be placed where change in slope, dimension and direction occur. Maximum spacing of manholes is 60-100 meters in accordance with the pipe diameter. Min. Ø 1000 mm manholes shall be placed where intersections are connected.

On gravity sewer pipes bends and reductions shall occur in manholes only.

All concrete shall be grade C30 and shall meet the requirements of Section 6 Concrete and Steel Work. The concrete shall be watertight and have a thickness of not less than 200 mm and incorporate water stops.

Rung irons or step irons are to be provided complying with the relevant provisions of EN 124 or equivalent Turkish Standard. Their size and strength shall be suitable for access to the manhole with a maximum vertical spacing between steps of 350 mm in a vertical alignment.

Pipes passing through the concrete walls of a manhole shall be provided with ductile iron or steel spool pieces with puddle flanges. Alternative means of preventing the passage of water are subject to the approval of the Engineer. A flexible joint shall be situated as close as practicable to the outside face of any manhole or other structure.

Manhole inverts and benching in sewer pipes, drains and culverts shall be formed in concrete grade C30 of the same gradient and diameter as the connected pipework and with a smooth finish. Alternatively manholes can be made in HDPE where appropriate. The same quality requirements as specified for HDPE pipes will apply for the manholes. For located in trafficked areas special reinforced concrete slaps shall be constructed to protect the upper end of the manhole shaft. The slap shall be designed for heavy traffic load. The access hole in the slap shall be minimum 1000x1000 mm and furnished with a hot dip galvanised steel cover hinged in one side and with a handle which can be flattened with the surface of the cover.

Requirements to access ladders, covers, etc in connection with the manholes are given in Section 7 - Mechanical Works.