



- Drawing Notes:**
- 225mm thick CI 20N/20mm Mass Concrete Foundations
 - Preformed half brick channel pipes. The pipeline may, where practicable, be laid through the manhole and the crown cut out to half diameter, provided flexible joints are situated on each side no further than 600mm from the inner face of manhole wall.
 - Manhole construction
 - For Surface Water Manholes high-density blocks to CI S10 of IS 20 Part 1:1987 or CI 30N/20mm in situ concrete.
 - Block work shall be bedded and jointed using mortar to IS 406. Beds and vertical joints shall be completely filled with mortar as the blocks are laid.
 - Joints shall be flush pointed as the work proceeds.
 - All Four Manholes must be faced in solid Engineering Brick (min. class A or B) or in situ concrete for 1 metre above Benching Level.
 - Brick to be bedded to block work using English Garden Wall Bond.
 - Relieving arch formed by 215x103x65 solid engineering bricks Class A or B as per drawing. Relieving arches used in brick or block work manholes extend over full thickness of wall. A Double Arch is to be formed for pipe diameters greater than 600mm.
 - Benching and pipe channel pipe surround - CI 20/20 concrete.
 - Benching finished in 2:1 sand-cement mortar with a smooth trowel finish, at 1 in 30 slope towards channel.
 - Standard rungs at 300mm vertically and galvanized to the latest version of S. 729 or equivalent. Note: Steps Irons are not acceptable.
 - 600mm square open roof slab.
 - Precast R.C. Roof Slab shall be 200mm thick in Class 30N/20mm, with 40mm cover to steel.
 - 1 to 2 courses of solid engineering bricks CI B to IS 91:1983 set in 1:3 (cement and mortar).
 - Class D400 or E600 manhole cover and frame to BS EN 124. 150mm deep frame for roads and 100mm deep for footpaths and green areas. Non-rock design. (bedded in situ). Manufactured from spherulitic graphite cast iron (ductile cast iron). 600 x 600 (600mm) clear opening. cover and frame bedded in blunton or other approved material, cover to have a minimum mass of 140kg/m². frame bearing area shall be 80,000mm² min. frames shall be designed to prevent covers falling into manhole. Frames shall be bedded on approved mortar to manufacturers instructions.
 - Short length plastic pipe joint external to manhole shall not exceed 800mm from the inner face of manhole wall.
 - Top holes of 200mm minimum depth and galvanized steel safety ladders to be provided in benching of sewers greater than 525mm diameter and depth to invert > 3m for access to invert.
 - A safety chain is to be provided on pipes that exceed 400mm in diameter. Mild safety chain shall be 10mm nominal size grade MH non-calibrated chain, type 1, complying with BS 4942 Part 2 or equivalent.
 - When depth of manhole to invert is greater than 3.0m ladders shall be used instead of rungs to BS 4211 or equivalent except that strings should be not less than 65 x 12mm in section and rungs 25mm in diameter. Fixed ladders should meet the dimensional requirements of BS 4211 or equivalent.
 - Ladder strings should be adequately supported from the manhole wall at intervals of not more than 2.0m strings should be bolted to cleats to facilitate removal.
 - All ladders, rungs, handrails, safety chains etc shall be hot dip galvanized to BS 729 or equivalent.
 - Pipe shall be cut flush with the inside surface of the manhole wall so that the channel extends the full length of the manhole (except for precast manholes).
 - Position of 910 square open in intermediate roof slab
 - All manholes shall be subject to the satisfaction of the Engineer.
 - Formwork to Reinforced Concrete and Mass Concrete shall comply with Class 2, Section 6.2.7, BS 8110 Part 1:1997.
 - Finish to the top of slabs shall comply with Type A, Section 6.2.7, BS 8110 Part 1:1997.
 - Plan dimensions of manholes are based on block work having a coordinating size of 450 x 225 x 100.
 - Manholes are designed to BS 8005 and wall thickness to LS 325 block work design code taking grouting fill pressure and H.B. surcharge.
 - Reinforcement to slabs to Engineers details.
 - For manholes > 3m depth to invert use 30N/20mm in situ concrete. Reinforcing mesh ref. A303 @ 6.10m/m to be fixed at mid point of wall. Additional reinforcement to be supplied over pipe crown.
 - For pre cast Manholes, Chamber walls and cover slab to be constructed to IS EN 1917 and IS 420 2004
 - Manhole Openings to be situated furthest from the nearest Carrieway. Manhole steps / access to be positioned to allow viewing of oncoming traffic.
 - For bedding and sealing of Chamber rings, the top ring (to pre cast cover slab) and bottom ring to be bedded with cement mortar. For intermediate rings, joints to be sealed with approved pre-formed jointing strip.
 - Pre cast Manholes to be surrounded with a minimum of 150mm thick Grade C20/40 concrete
- General Notes**
- All brick to be Solid Engineering Brick Class A or B.
 - For pipe diameter > 750mm use manhole with internal diameter size = pipe size + 1 metre + 300mm.
 - Distance from the top rung of the ladder to ground level must be a maximum of 500mm.