ORDER OF 'TAKING-OFF'

A logical order of 'taking-off' and full annotation in 'waste' is extremely important when measuring this class of work. Where separate drainage systems are to be provided for foul and surface-water drainage, it is advisable to measure the drains and associated work in each system separately, although it is usually quicker and simpler to take all the manholes together.

A good order of measurement to adopt is outlined below:

(a) Lengths of main drain commencing at the head of the drainage system and working downwards to the sewer or other point of disposal.
(b) Branch drains working in the same order.
(c) Connections, gullies, etc., at the heads of the branch drains, linking up with the work already measured under 'plumbing', and the building in of pipes at manholes.
(d) Manholes, measured in detail.
(e) Any other items, such as vents, fresh-air inlets, connection to sewer, testing drains, etc.
(f) Any septic tank installations, cesspools or soakaways, measured in detail.

It is good policy to check that all rainwater, soil and waste pipes and gullies are connected into the drainage system on the drawings, as odd lengths of branch drains are sometimes omitted.

MEASUREMENT OF DRAINS

The measurement of drains may often be broken down into three principal items:

(a) Excavation measured in linear metres in successive 1·50 m stages of depth, giving the average depth to the nearest 250 mm. For example where a drain trench runs from 1·10 m deep at one end to 2·20 m deep at the other, the trench will have to be split into two separate lengths when
measuring the drain trench excavation, one section being described as not exceeding 1·50 m total depth with an average depth of 1·25 m (1·30 m taken to the nearest 250 mm) and the other section as exceeding 1·50 m and not exceeding 3·0 m total depth with an average depth of 1·75 m, assuming that the ground has a uniform fall over the length of the trench.

The drain trench excavation item includes grading bottoms, planking and strutting, filling in and compacting and disposing of surplus soil, and these are to be stated in the description (S.M.M. X3a). Excavating trenches for pitch-fibre pipes are to be kept separate (S.M.M. X3b), as these trenches can often be of narrower width than those for glazed vitrified clay pipes and long lengths are frequently left open. Excavating trenches in clay and running silt or sand, in rock or below normal water-level are taken as 'extra over' normal trench excavation (S.M.M. X3c and d). Note the need for an item for disposing of water from the excavations (S.M.M. X3g and D19), as this is often overlooked by examination candidates.

(b) The supplying, laying and jointing of drain pipes, stating the kind of material (glazed vitrified clay, cast iron, pitch-fibre, etc.), quality of pipe (British Standard, British Standard Tested, second quality, etc.), internal diameter and method of jointing. The pipes are measured in linear metres over all pipe-fittings, with branches not exceeding 3·0 m in length so described stating the number of branches involved. Vertical pipes, as in backdrops to manholes, are also kept separate. Pipe-fittings such as bends, junctions, diminishing pipes, etc., are each enumerated separately as 'extra over' the pipes (S.M.M. X5).

(c) The different forms of concrete protection which may be provided to drains, now described in the Standard Method as 'beds', 'benchings' and 'coverings', but often described as 'beds', 'haunchings' and 'surrounds', must each be measured separately in linear metres stating the mix and size of the concrete, internal diameter of the pipe and including any necessary formwork (S.M.M. X4). The following illustrations indicate the various forms of concrete protection to drain pipes.