7 Measurement and Valuation of Work

This chapter covers the code of measurement and its application, taking measurements on site and keeping of essential records, evaluation of work on a dayworks basis, the making of interim and final valuations, valuation of variations and cost control by both the engineer and the contractor.

MEASUREMENT CODE AND ITS APPLICATION

Permanent Works

The principal code for the measurement of civil engineering work in the United Kingdom is the Civil Engineering Standard Method of Measurement1 (CESMM). The majority of bills of quantities for civil engineering projects are prepared in accordance with this code, and they provide schedules of items giving identifying descriptions and estimated quantities of the work classified in the manner prescribed in the code. This procedure ensures a reasonable standard of uniformity in the approach to the measurement of these works.

The item descriptions for permanent works shall generally identify the component of the works and not the tasks to be carried out by the contractor. Clause 5.8 of the CESMM contains provisions which are more difficult to implement, in that the bill is to distinguish between those parts of the work of which the nature, location, access, limitation on sequence or timing or any other special characteristic is thought likely to give rise to different methods of construction or considerations of cost. Similarly, clause 5.10 requires all work to be itemised and described in accordance with the work classification contained in the CESMM, but adds that further itemisation and additional description may be provided if the nature, location, importance or any other special characteristic of the work is thought likely to give rise to special methods of construction or considerations of cost. In both cases, the views of the person preparing the bill of quantities, and the contractor who carries out the work could diverge significantly as to whether or not any special characteristics apply to the particular items of work. The principal objective is that the CESMM work classifications provide a minimum detail of description and itemisation on which contractors can rely, but encourages greater detail in non-standard circumstances, particularly where cost significant aspects are involved.2
Method-related Charges

The engineer enters specified requirements in the bill of quantities covering such items as accommodation and services for, equipment for use by and attendance upon the engineer's staff; testing of materials and works; and temporary works. The contractor, in his turn, is given the opportunity to enter method-related charges for items which are not directly related to the quantities of permanent work. These items include accommodation and buildings, services, plant, temporary works and supervision. The temporary works can encompass a wide range of diverse operations, such as traffic diversion and regulation, access roads, cofferdams, pumping, de-watering, access and support scaffolding, pits and hardstandings. The contractor must distinguish between time-related and fixed charges and fully identify the items inserted. With time-related items the contractor is to enter full descriptions of the items, including time and cost elements, to facilitate the subsequent costing of the work.

The items entered as method-related charges are not subject to admeasurement, although the contractor will be paid for these charges in interim valuations in the same way as he is paid for measured work. In the absence of variations ordered by the engineer, the sums entered against method-related charges will reappear in the final account, and will not be changed as a result of the quantity of work carried out being different from that originally estimated by the tenderer. The contractor is not obliged to construct the works using the methods or techniques listed in his method-related charges, but he will nevertheless be paid as though the techniques indicated had been adopted. For example, if the contractor inserted charges for a concrete batching plant and subsequently used ready-mixed concrete, the appropriate interim payments will be distributed over the quantity of concrete placed. ²

Measured Work

The standardised approach introduced by CESMM does create some problems for the contractor in pricing billed items of measured work. On occasions associated work items are included in a bill term without the need for specific mention. For example, a typical earthwork bill item could read as follows:

E424 General excavation in natural material to a maximum depth not exceeding 1-2 m.

The rate would have to include the following items additional to cubic excavation, which are deemed to be included by rules in class E.

(1) Additional excavation needed for working space and removal of existing services.
(2) Upholding sides of excavation.