

Valuation of Variation under Lump-Sum Contracts



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Introduction

It is a common perception that variations frequently occur and in many cases inappropriately administered in the Industry. This paper attempts to discuss about valuation of variations under lump-sum contract according to the FIDIC conditions of contract fourth edition 1987.

Variation and Valuation of Variation

The complexity of construction works means that it is hardly possible to complete a project without changes to the design or the construction process itself. Construction scope of work exists in the form of drawings, and specifications earmarked for a specific construction site. Changes to the scope of work are generally called as variations initiated by the engineer on behalf of the employer.

In FIDIC conditions of contract, these types of alterations, additions, and omissions are dealt by clause 51(Variations). The engineer shall make any variation according to his opinion, be necessary or appropriate as per Sub-Clause 51.1. As per this sub-clause engineer shall have the authority to instruct the contractor to do any of the following as variations;

1. Omit any such work
2. Change the character or quality or kind of any such work
3. Execute additional work of any kind necessary for the completion of the works
4. Increase or decrease the quantity of any work included in the contract
5. Change the levels, lines, position and dimension of any part of the works
6. Change any specified sequence or timing of construction of any part of the works

Although the above-mentioned (1) says that the engineer shall omit any such work, these omitted works shall not be carried out by the employer or by any other contractor. A variation shall not in any way vitiate or invalidate the contract.

The engineer can only instruct variations. As per the sub-clause 51.2(Instructions for variations), the contractor shall not make any such variation without instructions from the engineer. Further, it says that no instruction shall be required to increase or decrease the quantity of any work where such increase or decrease is not the result of an instruction given under this clause.

These variations are valued in accordance with clause 52, unless the issue of an instruction to vary the work is necessitated by some default of or breach of contract by the contractor. If the default is with contractor, such cost shall be borne by the contractor.

Provisions for valuing variations are stated in Sub-Clause 52.1. (Valuation of Variations). It is simple to understand when explained in four points as follows:

- a) As per this sub-clause, all the varied work shall be valued at the rates and prices set out in the contract if they are applicable according to engineer's opinion. In the contract, bill of quantities/ Schedules of rates are the documents, which all rates and prices are fixed. Hence, varied work shall be valued according to the rates and prices in the bill of quantities. It is proven in the law suit, Henry Boot Construction vs Alstom Combined Cycles (1999). It states that the rate in the contract for piles was twice than what it should have been. When a variation was instructed for more piles under similar conditions

to the original work, the contractor argued that the contract rate should apply. Employer argued that a fair valuation should be made for additional piling. Court held, that the work is of similar character and executed under similar conditions to the work priced in BOQ and therefore the BOQ rates will apply. The fact is that BOQ rates being too high or too low is irrelevant. From this sub-clause parties to the contract have agreed that they will use value variations.

- b) If the contract does not contain such applicable rates, the rates and prices in the contract shall be used as the basis for valuation, the process known as Pro-rata basis. Using appropriate mathematics or logic, new appropriate rates and prices should be adopted from the rates and prices contained within the contract so far as may be reasonable.
- c) In case both these options fail, suitable rates or prices shall be agreed upon between the engineer and the contractor.
- d) In case of all these options failing the engineer shall fix rates or prices according to his opinion as appropriate and shall notify the contractor accordingly, with a copy to the employer as per the this clause.

Variations shall be measured in accordance with the method of measurement used in the original contract, which may be SMM7, CESMM3, or POMI etc.

It is apparent that agreeing or fixing rates or prices would take some time. To alleviate the negative effect on contractor's cash flow, the engineer shall determine provisional rates or prices to enable on-account payments to be included in monthly payment applications.

Lump Sum (Non Re-measurable) Contracts

Re-measurement & lump sum (Non Re-measurable) types are the main two types of contract pricing methods. In a re-measurement type contract, completed Works would be re-measured for payment purposes. BOQ items, quantities, descriptions are at the employer's risk. Final value of the works could either be more or less than the contract price.

In a lump sum (Non Re-measurable) contract, the works shall not be re-measured for payment purposes. Bill of quantity items, quantities and descriptions are at

contractor's risk. On completion of the works, the lump sum contract price would be paid in full to the contractor subject to the approved variations. In this kind of an instance, employer has essentially assigned all the risk to the contractor, who in turn can be expected to ask for a higher markup in order to take care of unforeseen contingencies. If the actual cost of the project is underestimated, the underestimated cost will reduce the contractor's profit by that amount. An overestimate has an opposite effect, but may reduce the chance of being a low bidder for the project.

It is important to remind that, in both types of contracts, contractor's obligation is to execute the Works shown in the drawings and specifications but not the BOQ or schedule of rates.

Variations of lump sum type contracts can be contractually agreed as follows in the construction stage, considering the unique advantages and disadvantages in each type by the engineer.

1. Schedule of Rates: Quantities not present in this type of contract. Contractor's obligation is to execute the works shown in the drawings and specifications. Rates set out in the contact shall be applied to any possible addition or omission in a variation at the later stage according to the engineer's opinion. (Refer Figure - 1)

| | | | |
|--------|---------------|---|--------|
| Item A | Boundary Wall | m | 100.00 |
|--------|---------------|---|--------|

Figure -1

2. Bill of Quantities with provision for adjustments for tenderer to price as necessary in respect of any missing items, errors in item descriptions, and differences in quantities (between drawings/ specifications and BOQ): Existing rates shall be applied to any possible addition or omission in a variation. Refer Figure – 2, illustrates a segment of example bill for this type.

| | | | | | |
|----------|---------------------------------------------------|--------|---|--------|-----------|
| Item A | Boundary Wall | 150.00 | M | 100.00 | 5,000.00 |
| Item A-1 | Insert here any adjustment required due to errors | | | | +5,000.00 |

Figure -02

3. Figure-3 illustrates bill of quantities without provision for tenderer to price an adjustment as above. The contractor does not have a place to include his/her price adjustments. Thus, contractor has to adjust rates against the given quantity until the amount reaches the required amount. Therefore, the contractor has provision to ask for new rates for additions and omissions in the contract.

| | | | | | |
|--------|---------------|--------|---|-------|-----------|
| Item A | Boundary Wall | 150.00 | m | 66.67 | 10,000.00 |
|--------|---------------|--------|---|-------|-----------|

Figure - 3

Conclusion

Considering an early start, with less pre contract works to employer and less risks to the employer, employer's may tend to select lump sum type contracts for their projects from time to time.

When valuing a variation under lump sum contract, any addition or omission should be valued using set out rates,

even though rates are inappropriate. However, if there is no provision in the BOQ to price adjustments to the contractor, at such instances parties can agree for new rates for value variations.

This demonstrates complexity of valuation of variation under lump sum contract. Thus, the contractor should be more vigilant and knowledgeable to value a variation including what he believes as entitled. The Engineer should be knowledgeable enough to assess and value a variation according to conditions of contract.

Reference

1. Conditions of Contract for works of Civil Engineering Construction Part 1 General Conditions 1987, FIDIC, Switzerland.
2. Procurement Guidelines 2007, Asian Development Bank, Manila.

Leicester Board of Guardians v Trollope (1911)

The clerk of works altered the design of a floor and as a result dry rot broke out in the floors some four years after completion. It was alleged that the defect arose owing to the negligence of the architect in not seeing that the concrete was properly laid in accordance with the contract. The architect denied that it was his duty to supervise the laying of the concrete and that this was the duty of the clerk of works who had been appointed by the Guardians.

It was held that while it was the duty of the clerk of works to supervise the details of the work, the laying of a floor such as this could not be regarded as a detail and that, therefore, the architect was liable in negligence.