

Develop a Strategy to Integration Lump Sum Contracts

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ABSTRACT

In the civil projects, lump sum contract has been used since 2007 in Iran, especially in national organization. In this contract, setting schedule of project and payment way is done by defining a working break down structure (W.B.S). According to fluctuation of currency, inflation and without adjustment in lump sum contracts and employers tendency in national organization to contract, edition and elimination of weaknesses are necessary. In this paper, by studying influence of items in integration civil contractor (inflation, schedule prices index and duration of contract) and the percentage of their influences a linear function is written as integration formula. Affecting this formula on lump sum contracts solves lump sum weakness such as, long delays, incomplete projects, low quality service of contractors and consultants, huge financial losses because of delays.

KEYWORDS: Lump Sum Contract, Civil Contract, Coefficient Integration.

1. INTRODUCTION

Nowadays setting correct contract plays a very important role. Knowing Advantages and disadvantages of each kind of contract is very important. In official contracts, organizations employ a person or legal person to do special project. After approving schemes and funding, consultant prepares tender documents, and one of the project management controls is chosen.

2. Project implements method

According to the references, the definition of project implementation is the composition and organization design services, procurement of goods (material and equipment) and construction (building and installation of equipment) and operation and maintenance of facilities of project which is done by the employer or by using other institutions [1, 2].

Totally, project implementation is a general terms that describes general process of design and construction including all methods of operation sequences of activities of contractual relation of a project[1].

In this new world, big changes are taking place in the way and form of projects and designs. According to estimates, project cost and its duration be reduce 5% in average and 33% in some cases [1].

Choosing the way of doing a project is one of the strategic Decisions takes places at end of feasibility study or at the same time or after making decision about the finance of the project [1].

Two defining characteristic for each project implement methods include the continuity of the project and founding by the public or private sector. Any method has advantages and disadvantages. Impalement will be successful if an appropriate strategy is chosen [2].

3. Unit price contract (lump sum)

In this method, contractors suggest the unit price (price for square meter of structure or price for a km of a road, etc.)

3.1. advantages of lump sum contract

- If contractor operate in high speed and the price does not change the calculation and providing statement easily.
- project is dividable and every details of each segment is predictable so payment is done in the end of each part
- If there is a full detailed map, all the details will be performed precisely.

3.2. disadvantages of lump sum contract

- In this method all details must be shown on scheme and a material notebook with all impalement details must be in index, because any lack of details and information makes a serious problem for contractor.
- Small defect in as built maps and presented details can affect the implementation process
- If the implementation details and materials are changed, the cost of changes should be predict at first and must be determined and approved by the parties to avoid discords
- In this method the dispute over the price is possible and the adjustment cannot apply to it [3,1,4].

4. Resolution of disadvantage in lump sum method

Now by virtue of article 22 of the planning and budget and article 6 of regulation performance standards development project ,approved in 1973 and in the context of country's technical and administrative system (issue decree no 42229/e of 334997, dated 20,04,2006 .)

Instruction for treaty with lump sum method is updated. And to clarify how to do the update, the way is shown as a parametric relation as follows:

$$F=(A.B).[C.D+1] \quad (1)$$

F= estimated price until the tender time and the implementation time

A= the estimated price based on the latest issued schedule of prices

B= alignment factor

B =
$$\frac{\text{The last issued branch index of adjustment or cyclic branch index which basic schedule of prices based on}}{\text{Cyclic branch index which basic schedule of prices based on}}$$

C = variation percent in the average three-month period

C =
$$\frac{\text{The last issued branch index of adjustment or cyclic branch index which basic schedule of prices based on}}{\text{Three-month issued branch index of adjustment such as the previous year}}$$

D = number of period between last issued branch index or cyclic branch index which basic schedule of prices based on (the latest one is chosen) and half of implementation time

5. developing integration formula

Although updating the estimation helps the contractors to offer the correct price but knowing the increase price factor at the tendering time doesn't mean accounting price fluctuation during the contract period. The main reason for failure of lump sum contract is currency fluctuations and inflation during the contract period so we introduce a new formula inspired by the parameters provided by the management and planning organization. This formula is affected by three terms as follows: inflation, schedule of price index, duration.

1.5 . inflation

Inflation is the official rate that is set by the central bank.

2.5. schedule of price index

Given that in many methods of contracts the basis for calculating the amount of the final prices of the contract is based on the schedule of prices. The effect of changes in various items of schedule of prices on the final amount of the contract and also the recent sanctions caused the price of some materials change more than the others ,and even have a lot of difference in prices of markets.

The items in schedule of prices of building, electrical and mechanical installation are divided into clusters based on increase percent of used items in the estimation of contraction project prices as follows.

Table1. Clustering of building schedule of prices

No.	Cluster1 (25%)	Cluster2 (35%)	Cluster3 (55%)	Cluster4 (25%)
1	Chapter 01	Chapter 03	Chapter 13	Chapter 27
2	Chapter 02	Chapter 04	Chapter 07	-
3	Chapter 05	Chapter 07	-	-
4	Chapter 06	Chapter 09	-	-
5	Chapter 08	Chapter 15	-	-
6	Chapter 10	Chapter 16	-	-
7	Chapter 11	-	-	-
8	Chapter 12	-	-	-
9	Chapter 14	-	-	-
10	Chapter 18	-	-	-
11	Chapter 19	-	-	-
12	Chapter 20	-	-	-
13	Chapter 21	-	-	-
14	Chapter 22	-	-	-
15	Chapter 23	-	-	-
16	Chapter 24	-	-	-
17	Chapter 25	-	-	-
18	Chapter 26	-	-	-
19	Chapter 28	-	-	-

Table 2. Clustering of mechanical installation schedule of prices

No.	Cluster1 (16.6%)	Cluster2 (26%)	Cluster3 (34%)	Cluster4 (41.5%)	Cluster5 (61%)
1	Chapter 04	Chapter 09	Chapter 01	Chapter 11	Chapter 03
2	Chapter 05	Chapter 15	Chapter 12	Chapter 13	Chapter 06
3	Chapter 14	Chapter 19	Chapter 17	Chapter 21	Chapter 07
4	Chapter 18	Chapter 22	Chapter 29	Chapter 27	-
5	Chapter 20	Chapter 24	Chapter 30	-	-
6	Chapter 23	-	Chapter 32	-	-
7	Chapter 25	-	Chapter 33	-	-
8	Chapter 31	-	Chapter 34	-	-

Table 3. Clustering of electrical installation schedule of prices

No.	Cluster1 (25%)	Cluster2 (31%)	Cluster3 (43%)	Cluster4 (61%)
1	Chapter 01	Chapter 03	Chapter 06	Chapter 7
2	Chapter 02	Chapter 08	Chapter 11	-
3	Chapter 04	Chapter 20	Chapter 27	-
4	Chapter 12	Chapter 26	-	-
5	Chapter 13	Chapter 28	-	-
6	Chapter 14	-	-	-
7	Chapter 15	-	-	-
8	Chapter 21	-	-	-
9	Chapter 22	-	-	-
10	Chapter 23	-	-	-
11	Chapter 29	-	-	-

3-5 time duration of contract

Time in contracts is the criterion implement of the treaty and the contractor must finish the contract in determinate duration.

6-integration formula

To calculate the impact percentage of each parameter, a questionnaire was distributed to senior managers and civil experts, then the results were analyzed by SPSS software and the formula was defined from statics.

Impact percentage of each parameter in the integration formula was obtained by multiplying the average value of each parameter for 95 percent, the accuracy of questionnaire, divided by the number of effective parameter. According to the statistical analysis, the following results were obtained.

Impact percentage of inflation rate (I) is 95%, schedule of prices index (L) is 70% and time duration (D) is 65%. According to proof of having linear and direct relation between these parameters, the formula expresses as follows.

$$F=95I+70L+65D$$

(2)

Formula 2 can rewrite as follows

$$F=0.42I+0.31L+0.29D$$

(3)

For integration of lump sum contract, this formula is applied on working breakdown structure. The applying method is that each written activities of working breakdown structure are modified by formula 3.

7. CONCLUSION

1. Integration in lump-sum contract is achieved by applying the integration formula (formula3.), subordinated of three parameters; inflation rate announced by central agency, the duration of contract and the increment of schedule of prices items.

2.the weakness of the lump-sum contracts are fixed by applying the formula 3 on the appendix working break down structure of contract and adding this comment to the contents of the contract.

3. The advantage of using this formula in lump sum contracts:

- Control of project delays, remove and control the large losses imposed on the employer, resulting from absence of on time operating.
- Motivate the contractor to deliver the project on time to the employer to use the benefit of being on time resulting by applying the integration formula.
- Minimize the deviation from the schedule presented at the beginning of the project.
- Increase the quality of services provided by the consultant (field supervision and advanced supervision) and decrease conflict between supervision engineers and contractors.
- Minimize the probability of incomplete project (involve contractors to article 46, 47, 48 of General Conditions of Contract.)
- Control the relations of main members of contract (employer, contractor, consulting engineer)
- Helping the contractor to suggest the correct price at the tender time.

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