IMPLEMENTING EICHELAY FORMULA IN GOVT. CONSTRUCTION PROJECTS

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ABSTRACT

In India, construction is the second largest economic activity after agriculture, and will account for nearly 65% of the total investment in infrastructure sector in the next five years. Investment in construction industry accounts for nearly 11% of India’s GDP. In general, construction projects are executed through contracts which are complex and not easy to comprehend even by experienced professionals. With advancement in technology and huge requirement of infrastructure in developing countries like India, there will be a huge increase in size and complexities of the nature of projects. This gives rise to ambiguities in the prevailing contracting methodologies eventually making contract documents more complex and difficult, causing adverse impacts such as increase in number of claims and disputes besides time and cost overruns. Studies and research on the problems of the construction industry have pointed out some fundamental causes of project failure; one of which is the proliferation of claims, disputes and litigations in the construction industry. To overcome this scenario, it is essential to develop a system that can assist the contract administrators to understand and evaluate the worth of their claims prior to taking it for litigation. The long gestation periods and the thin spread of resources are the main reasons for delay in completion of a number of ongoing projects. An attempt has been made here to introduce Eichelay formula to achieve this objective in case of disputes arising out of Time Delay and Extensions. Considering the above facts in the construction industry with reference to some specific government projects, a study has been carried out.

Keywords: Contracts, Contract Administration, Arbitration, ADR, Eichelay Formula
INTRODUCTION

The field of civil engineering is vast in scope and encompasses the whole of man’s endeavor to shape and improve the physical environment. Civil engineers are required to design and carry out the construction of large variety of works such as buildings, roads, bridges, railway lines, dams, docks, airports, power stations, water supply schemes, drainage schemes, tunnels and reclamation projects, etc. The contract agreement is obviously the most important document, because on its clarity would depend the smooth sailing and timely execution of any project. It is therefore essential for both the engineer and the contractor to be thoroughly acquainted with the basic principles of contracts, so that the agreement entered into by the parties is as flawless as possible. A thorough study of the contract agreement, both by the engineer and the contractor, is also equally important to avoid subsequent disputes and complications like legal problems (Ramkaran.K, 2010).

While implementing the projects, the government departments enter into a contract. Construction projects frequently suffer from delays and are usually completed within a period longer than what is agreed upon. Substantial financial claims can arise from those circumstances; and consequently clients and contractors often argue about the causes of and liability for the delay which may lead to legal complications between parties. Many times it is expressed that the legal problems in construction industry are most complicated problems and sometimes these problems result not only in stoppage of the work for years together, but also are cause of financial burden on the government and it becomes difficult to hand over the infrastructure for the public use for years together (Ramkaran.K., 2010).

Due to the cost and risk associated with litigation, construction professionals began searching for new ways to resolve disputes at early stage. Resolving construction disputes is easier when resolution occurs quickly at the lowest possible levels of management and with less confrontation. Traditional methods of dispute resolution are enormous and costly processes.

LITERATURE REVIEW

A majority of construction projects employ some methods to control and minimize the claims, disputes and litigations. Still, many cases occur due to negligence and lack of sense and coordination between the parties. This results in huge loss of money, time and manpower, which have become a major problem in construction industry. The solution these problems is possible through identification of reasons such as: legal complications, implementing ADR techniques, estimating the overhead damages and as to effectively minimize the consequent potential losses to reduce time delay and cost overruns (Ramkaran.K, 2010).

Anwar M. Omar in “Delay Claims Management in Construction” states that changes to the base contract occur almost in every construction project. These changes can result from the owner’s additional scope of work, differing site conditions, errors or omissions in the contract documents, delays by the owner, unpredicted conditions and constructive changes. Gajria, K in “Law Relating Building and Engineering Contracts in India” states that A Building contract is defined as a contract containing an exact description of the terms, account, or remuneration of particulars for the construction of a building” (Gajria, K., 2000). Glenn Grenier in “The Traps and pitfalls of construction delay claims” describes that the Eichelay formula allocates the contractors total head office overhead to the delayed project based on the ratio of project billings to total billing for the period of performance (Glenn
Grenier, 2005). John Mendes in ‘The Delay Claims - Measuring the Impact' says that a contract states that work will be performed over a certain period of time and both parties rely on this expectation. Rajan, G.A.N in “The Engineering Contracts, Construction Disputes and Remedies” says that it has been observed that as a result of number of pitfalls and flaws, the parties are put to unbearable losses and litigations in the execution of contracts (Rajan, G.A.N., 1996). Good client-contractor relationships are important to both parties for the success of a project and anticipated future work. Semple et al found that making provisions in a construction programme for events such as weather delays reduces disputes. Cost and time claims, especially those which are difficult to quantify, regularly result in disputes between the contractual parties. Weather contingencies are very seldom adequate, in terms of progress and cost, due to the use of heterogeneous methods used in the industry for weather contingency calculations. This results in adverse client-contractor relationships (Semple, C., et. al, 1994).

Alternative Dispute Resolution

As construction budgets and schedules for completion continue to tighten, current construction projects are increasingly fraught with tremendous risk. Claims and disputes over even the smallest issues can quickly escalate, with crippling consequences to the parties involved therein (Anwar.M.Omar, 2007). ADR techniques are introduced as an alternative method to facilitate dispute resolution process to avoid litigations between owner and contractor. ADR techniques usually involve selection of a third party, often contract/claim experts. Construction delay claims are among the most complicated claims and almost always require the services of an expert to both determine damages and to defend against them (Ramkaran.K, 2010).

Different types of claims raised by the contractor under ‘Time Delay and Extension’ are as follows (Thomas Wong, 2008):

- Variation and escalation due to extended stay
- Extension of Time for delays
- Demobilization charges for carrying out delayed work
- Compensation for idle labour plant, etc. due to delays
- Loss of overheads and profits
- Compensation for extra expenditure incurred on overheads, establishment and other supervisory expenditure due to extended stay
- Amount withheld towards liquidated damages
- Mental agony, torture, stress, defaming

Fig. 1 shows the flow chart of the issues which are not resolved between the two parties ultimately leading to legal problems in the construction industry.
Recovery of Delay & Disruption Costs

It is obvious that builders work for a profit and apart from his entitlement to the price, the damage to a builder caused by any breach of contract by the employer will be assessed in light of its impact upon his profits. Damages of lost profits and increased overhead costs may be claimed for a project that has been delayed, for the losses incurred during the period of delay.
**Typical Heads of Recovery of Delay Costs**

- Head Office Overheads
- Loss of Profit
- Site Overheads
- Price Adjustments
- Interest and Finance Charges
- Inflation

**Typical Heads of Recovery of Disruption Costs**

- Plant, Tools and Equipment
- Loss of Productivity
- Redeployment of Workmen

**METHODOLOGY**

When a contractor is entitled to be compensated for owner-caused delay, it is generally accepted that unabsorbed and/or additional office overhead will constitute part of this compensation. Once entitlement to this compensation has been established, the damages must be quantified. In the case of delay, damages are generally calculated from the date of the planned completion of the project.

Sometimes courts simply allocate a fixed percentage to overhead, as set out in the contract and award this amount in damages for lost overhead of the delay. If a percentage cannot be agreed upon, it has been suggested that the formulae set out below may assist the courts in coming to a conclusion on overhead allocation.

**Eichelay Formula**

Construction delay claims are among the most complicated claims and almost always require the services of an expert to both determine damages and to defend against them. It can be intended as a mechanism for computing the compensation a contractor can appropriately recover for unabsorbed overhead due to a govt caused suspension or delay. This component of delay damages often accounts for a very large portion of the amounts claimed. The basic Eichelay calculations normally come at the end of a project when all work has been completed.

The use of the Eichelay formula to recover unabsorbed home/office overhead costs has been a hot topic in recent years as courts have struggled to provide a framework of objective factors to govern the formula application. The concept of the “Eichelay Formula” method in calculating the home office overhead damages claims, due to govt caused suspension or delay, explained as claims for the recovery of unabsorbed or misallocated indirect expenses are not easy to comprehend. Such claims arise whenever the performance of a contract has been suspended, delayed or otherwise disrupted reducing the stream of direct costs upon which overhead or indirect costs are allocated. There are normally many components to consider when calculating delay damages and the Eichelay formula deals with only one of these components (Andrew D. Ness., 2005).

The Application of Eichelay formula is done in three steps:

1. To find allocable contract overhead
2. To get daily contract overhead rate
3. To get the amount recoverable
Case Study: Settlement of Claims Using Eichelay Formula

Table 1 shows the summary of all the four projects, where “Eichelay formula” is used for calculating the overhead damages claims, due to govt. caused suspension or delay.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name Of The Project</th>
<th>Estimate Contract Value (in `)</th>
<th>Lowest Contract Value Quoted (in `)</th>
<th>Actual Period Of Completion (Months)</th>
<th>Delay Period (Months)</th>
<th>Total Contract Performance Period (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Extension &amp; Renovation of District Hospital at Nizamabad</td>
<td>11,57,81,807</td>
<td>11,74,83,800</td>
<td>24</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>2.</td>
<td>Construction of Area Hospital at Medak</td>
<td>4,85,72,560</td>
<td>4,91,79,717</td>
<td>24</td>
<td>9</td>
<td>33</td>
</tr>
<tr>
<td>3.</td>
<td>Construction of PHC Bldgs Package – Nizamabad &amp; Medak</td>
<td>6,77,09,862</td>
<td>6,85,46,125</td>
<td>15</td>
<td>12</td>
<td>27</td>
</tr>
</tbody>
</table>
I. Project 1

*Table* 2 lists the financial values of the project 1 as part of case study of implementing Eichelay formula in calculating the home/office overhead damages claims, due to govt caused suspension or delay.

<table>
<thead>
<tr>
<th>Description</th>
<th>Adjusted Delay Days (())</th>
<th>Adjusted For Additional Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue as per Financial Statements</td>
<td>117483800</td>
<td>117483800</td>
</tr>
<tr>
<td>Delayed Contract Revenue</td>
<td>27021274</td>
<td>27021274</td>
</tr>
<tr>
<td>Percentage of Delayed Contract Revenue to Total Revenue</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Total Actual Indirect Expenses</td>
<td>1,35,10,637</td>
<td>1,35,10,637</td>
</tr>
</tbody>
</table>

**Eichelay formula Step 1.**

Overhead allocable to Delayed Contract =
\[
\frac{\text{Contract billing}}{\text{Total billing for contract period}} \times \frac{\text{Total overhead for contract paid}}{\text{Contract billing}}
\]

\[
\text{Option #1 (\(\))} = 3107446\]

\[
\text{Option #2 (\(\))} = 3107446 \times 0.46
\]

<table>
<thead>
<tr>
<th>Description</th>
<th>Adjusted Delay Days (())</th>
<th>Adjusted For Additional Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Indirect Expenses Recovered On Unplanned Work</td>
<td>0</td>
<td>320000</td>
</tr>
<tr>
<td>Remaining Indirect Expenses Allocable to Delayed Contract</td>
<td>3107446</td>
<td>2787446</td>
</tr>
<tr>
<td>Number of Actual Days of Delayed Contract Performance</td>
<td>1080</td>
<td>1080</td>
</tr>
</tbody>
</table>

**Eichelay formula Step 2.**

Daily Contract overhead (i.e., Daily indirect rate) =
\[
\frac{\text{Overhead allocable to delayed contract}}{\text{days of contract performance}}
\]

\[
\text{Option #1 (\(\))} = 2877\]

\[
\text{Option #2 (\(\))} = 2581\]

<table>
<thead>
<tr>
<th>Description</th>
<th>Adjusted Delay Days (())</th>
<th>Adjusted For Additional Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Actual Days of Delayed Contract Delay (12M x 30 days)</td>
<td>360</td>
<td>360</td>
</tr>
<tr>
<td>Partial Work Stoppage Adjustment</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Adjusted Days of Delayed Contract Delay</td>
<td>180</td>
<td>360</td>
</tr>
</tbody>
</table>

**Eichelay Formula Step 3.**

Damages Recoverable =
\[
\text{Daily of contract overhead} \times \text{number of days delay}
\]

\[
i.e. \frac{2877 \times 180}{2877 \times 360} = \frac{517860}{1035720}
\]

<table>
<thead>
<tr>
<th>Description</th>
<th>Adjusted Delay Days (())</th>
<th>Adjusted For Additional Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Indirect Expenses Recovered On Unplanned Work</td>
<td>-</td>
<td>320000</td>
</tr>
<tr>
<td>Damages Recoverable - Eichelay Method</td>
<td>517860</td>
<td>929149</td>
</tr>
<tr>
<td>Allowable Damages Recoverable</td>
<td>517860</td>
<td>-</td>
</tr>
</tbody>
</table>
Normal method of calculation of overhead charges claims due to the Government caused suspensions or delay, after submission of the correct statements, proper proofs & verifications of records maintained by the contractor of that particular work is tabulated in Table 3.

| Table 3 : Proofs and Verifications Of Records Maintained By The Contractor |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1               | Technical staff billings | 25000          |                 |                 |                 |                 |
| 2               | Auditors for account works | 24000          |                 |                 |                 |                 |
| 3               | Office manager and attender & watchman | 15000          |                 |                 |                 |                 |
| 4               | Expenditure for accommodation and unforeseen items | 6000           |                 |                 |                 |                 |
| **Total in `**  | **70000**        |                 |                 |                 |                 |                 |
| Damages claimed by the Contractor for delay period (i.e., 12 Months) | 12 x 70,000 | **8,40,000**     |                 |                 |                 |                 |

Allowable Damages Recoverable (i.e., the contractor entitled for claim) - Rs. 5, 17,860/-

**RESULTS**
The results obtained from the above case studies are provided in Table 4.

<p>| Table 4 : Final Summary Of Results Of All Projects |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Work</th>
<th>Contract value of Work (Crores)</th>
<th>Contractors claim (Lakhs)</th>
<th>Calculation As Per Eichaley Formula (Lakhs)</th>
<th>Allowable Damage Recovery (lakhs)</th>
<th>Saving Amount Saved Due To Eichaley Formula calc. (Lakhs)</th>
<th>% of Saving Over Contractors Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Extension &amp; Renovation of District Hospital at Nizamabad</td>
<td>11.75</td>
<td><strong>8.40</strong></td>
<td>5.18</td>
<td>5.18</td>
<td>3.22</td>
<td>38%</td>
</tr>
<tr>
<td>2</td>
<td>Construction of Area Hospital Medak</td>
<td>4.92</td>
<td><strong>2.70</strong></td>
<td>1.55</td>
<td>1.55</td>
<td>1.15</td>
<td>42%</td>
</tr>
<tr>
<td>3</td>
<td>Construction of PHC Bldgs Pkg – Nizamabad &amp; Medak</td>
<td>6.85</td>
<td><strong>4.80</strong></td>
<td>2.57</td>
<td>2.57</td>
<td>2.23</td>
<td>26%</td>
</tr>
<tr>
<td>4</td>
<td>Construction of APRPRP Bldgs Pkg – Medak</td>
<td>15.80</td>
<td><strong>8.40</strong></td>
<td>6.45</td>
<td>6.45</td>
<td>1.95</td>
<td>23%</td>
</tr>
</tbody>
</table>
CONCLUSIONS

The concept of ADR is vital and is suggested to improve the settlement mechanism and avoid the legal disputes between the owner and the contractor. If disputes are not resolved promptly and they are allowed to drag on and escalate, they can cause project delays, leading to more claims; requiring litigation proceedings for resolution that ultimately destroys business relationships. This formula is widely used in the U.S & Canada, and it has shown acceptable results in the present case study also.

- The Eichelay formula is widely used as a method of calculating overhead damages in construction delay cases. Considering this aspect, a study is undertaken to understand the legal issues and ultimate results of claims related to project delays and cost overruns in construction industry.
- Eichelay formula is applied in some cases and the results were found to be satisfactory, as the amount claimed by the contractor for the payment of compensation for delay caused by the owner is reduced, which is genuine and acceptable by both the contractor and the owner, because this formula consists of evidence, true parameters and strong concept base in calculations instead of hypothetical assumptions.
- The applications of Eichelay formula calculations are useful as it has formula based concept and parameters are readily available from the payment bills of the contractor.
- This formula helps in quantification of damage claims with clarity and reduces the legal complications in construction industry to some extent.
- The methods and the systems examined in this paper are given in order to suggest an alternative method in place of existing methods. It discusses the way the claims, disputes and legal issues for settlement of the problems of the parties can be settled through forums, court or non judiciary systems, which are less expensive and offer speedy settlement.
- It is hoped that this study will not only help the construction industry for E-governance but also help further studies in this direction.
- The recommendations and suggestions arising out of the study will help the authorities who are intrinsically connected with regulating the construction industry, to make the desired changes, which are much required for the better progress and development of the construction industry.

REFERENCES