CLAIMS IN CONSTRUCTION PROJECTS “DESIGN ERRORS AND CHANGE ORDERS”

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ABSTRACT

In the implementation of a construction project, there are many difficulties and unexpected problems in the design phase. In some cases these problems are caused by design and sometimes consulting engineer or supervisor depends on diligence in solving these problems by changing the orders issued to the Contractor simple limited or large comprehensive.

In both cases, these problems date back to the engineer or related with him and usually it leads to the claims of contractor’s, material or time, or both, in turn, leads to an increase in the cost of the project and its duration for the owner of the project. This study aims to know the types of claims that occur in construction projects because of mis-design that goes back to the General Engineer.

This study is based on a sample statistic, random, for projects implemented in Libya during the last ten years and it has been the monitoring of claims and their impact on the project, which resulted mainly from design errors and change orders that were later during implementation, define this search the causes of claims and types which are generally related to engineer, through a sample of these projects, and then concludes that a number the results can be taken to avoid occurrence of such claims in the future.

Key words: claims, change orders, risk management, construction projects.

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1. INTRODUCTION

It's hard to imagine that engineering project, implemented without any difficulties and unexpected problems. No matter how small or large size of the project, no matter the type of project, there are expected problems, and therefore its difficult to imagine also that the contractor whether large or small, has performed a certain project without any various claims, there are problems and difficulties present always in engineering projects, and there are risks in the nature of these projects, and it is difficult in some cases. Lack of prognosis or prediction of these problems before starting the implementation of the project or
during the study design, results in these problems. In most cases, different claims pertain to all parties to
the contract or the project, some of these problems are resolved amicably and some of find their way to the
court because of the containment of design defects or errors relating to the design, and the change orders
that even are given to the contractor during the execution and orders from the supervisor engineer. Even if
these orders are to avoid design errors, or at the behest of the owner in order to improve the function of the
project and as a result this increases the cost and duration of projects implemented which will reflect
negatively on the project owner.

According to the International Federation of Consulting Engineers, FIDIC defines claims and "there is
no construction project without the occurrence of difficulties and problems or disputes, because of the
nature of the construction and risks, especially if the project continues for a long period of time to
implement it. Because of the nature of the construction and risks, especially if the project continues for a
long period of time to implement it, found during the execution conditions were not taken into account
during the development of the tender documents or the contract, or disputes occurring during the
interpretation of the items of the contract. It is permissible then to the contractor in accordance with these
conditions to make claims against the owner in the contract, such claims because of the termination of the
contract or cancel it. As the owner may submit claims in some cases under a contract FIDIC.

1.1. Claim Definition
FIDIC knows Claim in construction contracts as an injured party request for appropriate compensation for
damages incurred based on the terms of the contract or because of violation of one of the Parties to the
contract or the law of the contract.

The claim may be by the contractor or the owner of the project and requires FIDIC filing the claim
(period or compensation) to the supervisor or consultant engineer. If the party did not accept the claims
according to the opinion of the engineer or his estimates and refuse it, he must write claims. We can say
that any breach of one of the terms of the contract by the parties will lead to the occurrence of claims and
then in most cases of differences.

Typically the construction contracts contain provisions which provide for the method of evaluation of
claims, and then how to resolve the differences between the parties to the contract. The global and
international laws for contracts focus on the role of the consulting engineer to assess the claim, where the
claim is evaluated

It is then submitted to the engineer in two phases: -

• Is there a reason to claim a contractual or legal agreement?
• Then comes the calculation of the compensation or cost or extension phase.

1.2. The Objective of Study
The research aims to detect the size of claims, types, and sources in the engineering studies for
construction projects executed in Libya, which contributes to increasing the duration and cost of these
projects and lead to the loss of the national economy. The research also aims to develop an effective
strategy in order to avoid the occurrence of these claims or minimise the effects of these disputes between
the parties to the contract. This strategy is summed up in a system for the management of these claims or
disputes in construction projects before they occur.

2. MATERIALS & METHODOLOGY
The basic material of this research was the available data on the implementation of housing projects in
Libya. And the data was studied analysed n study and analysed to extract conclusions and data about these
projects regarding the types of claims and their causes.

The focus was on the errors in the design and claims caused by the design engineer, supervisor
engineer, the financial value of these claims and the length of time also. The methodology used in this
study was based on statistical sampling randomness, the sample volume in this study is 8 projects selected randomly. Information was from the establishments and departments owners, which are in many cases the authority supervising Also, through the projects documents completed and under implementation.

2.1. Questionnaire Survey
This questionnaire is an important part of data collection in the project, the questionnaire consists of five sections with a total of 34 questions.

The value of these claims differs from one project to another project, depending on the amount of fault, according to the project volume and type. In some projects, the proportion of claims up to a large value of the cost of the project creates real financial difficulties to the owner of the project, while some projects have been stopped for a long period of time as a result of these claims, and have failed.

Table (1) shows a list of some projects that contain orders for change as a result of design errors and change orders, the table also shows a comparison between data and information relating to (the duration and cost) for Change Order and the duration and cost of the original contract.

<table>
<thead>
<tr>
<th>N</th>
<th>principal contract</th>
<th>the value of change Order</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value LYD</td>
<td>Duration/month</td>
</tr>
<tr>
<td>1-</td>
<td>49,823,600.000</td>
<td>18</td>
</tr>
<tr>
<td>2-</td>
<td>15,028,000.000</td>
<td>18</td>
</tr>
<tr>
<td>3-</td>
<td>14,896,000.000</td>
<td>18</td>
</tr>
<tr>
<td>4-</td>
<td>11,704,000.000</td>
<td>18</td>
</tr>
<tr>
<td>5-</td>
<td>18,620,000.000</td>
<td>18</td>
</tr>
<tr>
<td>6-</td>
<td>31,920,000.000</td>
<td>18</td>
</tr>
<tr>
<td>7-</td>
<td>14,896,000.000</td>
<td>18</td>
</tr>
<tr>
<td>8-</td>
<td>26,600,000.000</td>
<td>18</td>
</tr>
</tbody>
</table>

Analysing the data given in table (1), we find the following:

The supervising engineer and the owner together issued the change orders to avoid design flaws and lack of supervision in the early stages of the project, and therefore, we find that the additional cost value ratio of between 2.02% in the project No. 7 and 19.1% in the project No. 3 and we find that the value of the additional period of between 33% in the project No. 4 and 88% in the project No. 1

2.2. The most important differences and claims that occur between the contractor and the owner
Differences occur in engineering contracts as a result of divergent views in understanding some of the issues between the parties to the contract, and can be classified as engineering differences on the basis of the following sources, see Figure (2):

A-Design engineer (or Contract Documents / project file)
B-Supervising engineer: or quality control of the project and project management contract
C- Management (owner)
D- Contractor
E- Contract
F- Other problems.

The design engineer is responsible for the preparation of the study and documentation of the project before the implementation phase and the supervising engineer who is overseeing the project since the beginning of implementation.

The situation will be examined in two phases, the first phase will discuss claims belonging to the stage study of the project, and in the next phase, we will discuss the engineering claims belonging to the supervising engineer on the implementation of the project.

The study or engineering design for the project and drawings and contract documents are the first cause of claims and disputes between the contractor and the owner, especially with regard to the specifications and the pricing method or estimate the price.

Figures (3,4,5) shows the parties to the claims and parties that cause them and the share of each party, as contained in the sample of the projects studied.

**Figure 2**

**Figure 3** Parties to the claims
2.3. Claims caused by the contract documents and other problems

As shown in Figure (5) the contract documents had substantiated claims of 60% of the total claims, and other problems such as (Rising prices, Force Majeure, Climate, Currency value, Labour) had substantiated claims of 40%.

Claims are caused by the design engineer when Conducting a study of the project including documents and drawings and specifications, where it is possible that the engineer commits unintended errors due to lack of awareness or weakness of experience in the design work as a result of Insufficient time, which, these errors can cause disagreements between the parties of the project resulting in financial and time claims of both the contractor and the owner, and an increase in the quantity and volume of these errors increases the volume of the project. These errors are called Design error.

According to Building Research Establishment -BRE estimates that 60% of the studied projects in Britain contain design errors, and this error ranges from simple and functional error to a large structural fault.
Through this study of the causes of claims, these claims can be classified into:

2.3.1. Technical Documents Claims
It is possible to make mistakes during the preparation of the technical documentation for the project (tender documents of the project), causing many claims and these claims are divided into the following:
A - Claims of technical specifications.
B - Claims because of errors estimate prices.
C - Claims of quantities tables.
D - Contract claims.

**Claims of technical specifications:** These claims come due to errors in the writing and preparation of this specification. It was the volume of the claims relating to the specifications in the studied sample of 10% (see Figure 6).

**Claims of quantities tables:** Result from the wrong estimate of the quantities of the project by more than the contractual ratio, and the volume of the claims relating to erroneously estimate quantities in the studied sample 20% (Figure 5), a large proportion. This is due to the speed in the calculation of quantities by the engineer and not on detailed plans.

**Contract claims:** These claims relate to documents contract (the original contract) with the contractor, such as the difference between the contract items and conditions and the general conditions of legal, technical documents. In most documents contracts for these projects are of major differences, which give many possibilities of interpretation leading to various financial claims of the parties to the contract, In the sample studied was the percentage of the claims relating to the contract was 10%.

The figure shows (6) common claims in the sample of projects as a result of errors in the design or project documents

![Figure 6 Claims ratios in construction projects and its causes](image)

2.3.2. Drawings Claims
Causing mistakes in the preparation of project drawings have several claims, including:
1- Claims because of architectural errors with a percentage of 20%.
2- Claims because of geotechnical studies and reports of soil and this is one of the most common claims and with a percentage of 40%.
3-Claims due to errors in the measurement of the project area in hectares and again per square meter.

3. RESULTS
By studying the claims and analysis in the sample projects, we conclude the following:
1. One of the main reasons for claims in construction projects is the engineering design for the project errors.
2. There is the need to develop a methodology for the selection of the design engineer and supervising engineer for the project well.
3. Application to achieve the quality of the Engineering Design System.
4. The composition of an expert team to the project owner to control the design stage in accordance with the requirements of the standards and codes design.
5. Reducing change orders version of the supervising engineer consultant, especially those undocumented entrepreneurs of the administration, it leads to financial and time claims of the contractor.
6. The need to develop a system for the management of claims in each project.

4. CONCLUSION
This study determines the defining qualities of construction claims which could impact on the implementation of the engineering project. The finding of this study shed some light on the construction claims; it was found that engineering design and geotechnical are a potential error for engineering projects in Libya.

This study will help the industry personal gather the appropriate information about construction claims for this study is recommended regarding construction claims, construction claims, which could be faced during the implementation of engineering projects and induced consulting engineer either designed or supervisor of the implementation through a sample of the executed projects in Libya projects study. It was found that more potential errors are in the engineering design of the project as well as the geotechnical studies the reports of the soil will lead to claims.

REFERENCE


