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**CONSTRUCTION ENGINEERING AND MANAGEMENT STREAM**

**CAUSES OF LIQUIDATED DAMAGE: THE CASE OF AGARO CAMPUS LOT II  
CONSTRUCTION PROJECT**

**An independent case study submitted to the School of Civil and Environmental Engineering Jimma University, Institute of Technology in Partial Fulfillment of the Requirements for the Degree of Master of Engineering in Construction Engineering and Management**

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**June, 2016**  
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## ABSTRACT

*The construction project site is located in Oromia Regional State in Jimma zone, in Agaro town. Agaro town is located at 390km from Addis Ababa. Agaro Campus Lot II Construction Project is property of Jimma University.*

*Projects are often implemented as a means of achieving an organization's strategic plan. Almost all civil engineering constructions are undertaken in project form having a predefined cost, completion time and quality. A timely performance of the contractor in the construction field is essentially important for the client and the contractor.*

*It is generally accepted that liquidated damages clauses have benefits for both parties to a contract. Liquidated damages is a sum fixed by the parties to a contract as a genuine pre-estimate of damage in the event of a breach, whether as a predetermined lump sum, or by means of a specific calculation or scale of charges. On the specific case of Agaro campus lot II project, a desk research method was employed to assess the causes and effect of the construction progress which lets to the project to liquidate.*

*Consequently, the results of payment utilization, advance payment repayment, and the work plan progress evaluation over the entire months of the contract period, shows the project liquidated on the progress status of below ten percent. And this were attributed to the disinterest to work caused by advance payment misuse by the contractor and bankruptcy fear. However the contractor's intention was not strongly realized by the client and the consultant for he should have been terminated by mutual agreement before the contract period has expired.*

*Keywords: Contract, Liquidated damages*

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## **LIST OF ABBREVIATIONS AND/OR ACRONYMS**

PPA	Public procurement Agency
GCC	General Condition of contract
SCC	Special condition of contract
FIDIC	Federation International Des IngenieursConseils

## 1. INTRODUCTION

### 1.1. Background

Construction industries have great influence on the state of the nation's socio-economic health. In fact, this industry is the keystone in the growth of the national economy of most countries. Times of prosperity are largely sparked by extensive private construction; in periods of recession, when construction volume suffers drastic cutbacks, government sponsored public works are used to reduce unemployment. A high level of construction activity is an indispensable element of any nation and it is also an indication of the country's healthy economy.

The construction project site is located in Oromia Regional State in Jimma zone, in Agaro town. Agaro town is located at 390km from Addis Ababa. Agaro Campus Lot II Construction Project owned by Jimma University.

Projects are often implemented as a means of achieving an organization's strategic plan. Almost all civil engineering constructions are undertaken in project form having a predefined cost, completion time and quality.

For many projects, owners shift at least part of the risk of late completion onto contractors. The most common form of risk shifting is the inclusion of a liquidated damages provision in the construction agreement. Liquidated damages are damages defined in the construction contract and chargeable against funds due to the contractor for each day the contractor fails to complete the project beyond the contract completion date. Hence, a liquidated damage provision provides a straight forward method of calculating damages recoverable by an owner in the event of late completion



Contract time is an essential element in construction contracts, and a contracting agency must ensure the work is completed accordingly. Through administering a contract the contracting agency incurs costs associated with engineering, inspection, and supervision of the work being performed. If the contract extends beyond the allotted contract time the owner will endure additional administrative costs that were not anticipated at the time of contract formation. Failure to meet a contract completion date constitutes a breach of contract that entitles the contracting agency to incurred additional cost. "Liquidated damages" refers to an amount that contracting parties, at the time of contracting, agree to be payable as compensation in the event of a breach.' Such damages are designed to alleviate uncertainty over the extent of the parties' potential liability without relying on the courts.[1]

The purpose of a "Liquidated Damages" clause is to establish in advance of contract performance a reasonable estimate of the damages that would be incurred as a result of unexcused delays, which causes the work to extend beyond the completion date. Regarding breach of contract, in the unlikely event the owner is able to replace the breaching contractor with one who finishes by the original completion date, the breach would not be covered by the typical "Liquidated Damages" clause. Since this is a rare occurrence, the term "breach of contract" is used in this Briefing to indicate a breach which does delay completion of the work. The reasons for employing liquidated damages provisions fall into two broad categories: they (a) allow you to predict your potential losses (and thus plan work and utilize manpower to control your risk), and (b) improve upon deficiencies in the litigation process. Neither party to a contract particularly relishes the thought of arguing the reasonableness (or unreasonableness) of actual damages, or having a Court determine the amount of damage. Where the amount is uncertain and difficult to estimate, experience has

shown that the estimate of a Judge or jury is no more likely to be exact compensation than the advance estimate of the parties.

Several activities may occur on construction projects to delay any given activity or the overall project. These delays increase both the contract completion time and the costs for the parties involved. A contractor is liable for the time and costs associated with a non-excusable delay. A non-excusable delay is caused by the contractor or its subcontractor that affects the project completion and additional time is not granted by the owner. In the case of a non-excusable delay, the contractor assumes the risk of cost and consequences; not only his own but possibly of all the parties involved as well. Non-excusable delays may be due to subcontractor's actions, inadequate supervision, and failure to provide materials and equipment on time, and so forth. These non-excusable delays may constitute a breach of contract by the contractor and can result in termination of the contract. According to Thomas et al. (1995), a liquidated damages provision is a less expensive and time saving option than proving actual damages in court.[2]

"Liquidated damages" refers to an amount that contracting parties, at the time of contracting, agree to be payable as compensation in the event of a breach.' Such damages are designed to alleviate uncertainty over the extent of the parties' potential liability without relying on the courts.[1]

## **1.2. Case Study Problem**

In Ethiopia there are many contractors that are viable to facing liquidated damage but due to the purpose of motivating the local contractors in performing well contributing to the infrastructure growth many of the related cases were mitigated with in the responsible parties. Although this was the general condition there was a case in Agaro Campus Lot II

construction project where the project was faced to maximum liquidated damage. This specific project has caused a huge impact on the client's schedule and also on the contractor.

Hence, the researcher will investigate the causes of the liquidated damage of the specific case study; i.e. the case of Agaro Campus Lot II Construction Project.

### **1.3. Case Study Significance**

Since the country's infrastructure growth is very rapid much of the country's budget is invested in these types of investments. Thus, being affected by any drawbacks faced due to awarding, construction and implementation of any construction project. Out of these drawbacks facing liquidated damage is one that has been hindering the progress in a significant manner. Hence by identifying the causes and providing remedial actions for eradicating liquidated damage the researcher believes that he will provide a guide in handling the above mentioned cases. The researcher will make an attempt to provide insights on the Cause of liquidated damage in Agaro Campus Lot II construction project.

### **1.4. Case study Objectives**

In referring to this study there can be many objectives but the researcher has focused on attending to the objective stated below;

#### **1.4.1. General Objective**

- ✎ To provide a general guide in order to prevent the incidence of liquidated damage based proposed recommendations

#### **1.4.2 Specific Objective**

- ✎ To identify the main causes of liquidated damages of Agaro campus lot II construction project.
- ✎ To recommend suitable measures that could have solved the problems

#### **1.5. Case study Scope**

In order to address the problem at hand, i.e. contractors being forced into liquidated damage, the researcher will discuss the issue using desk study method by referring to archives and other references. This study will thoroughly discuss the causes of liquidated damage faced on Agaro campus lot II construction project and their respective solutions.

## 2. LITERATURE REVIEW

### 2.1. Liquidated Damages

“Liquidated damages are a contractually stipulated amount to be paid to the Owner instead of actual damages if the contractor fails to meet the contract's milestone dates”[3].

A timely performance of the contractor in the construction field is essentially important for the client and the contractor. It is generally accepted that liquidated damages clauses have benefits for both parties to a contract[4].

Liquidated damages is a sum fixed by the parties to a contract as a genuine pre-estimate of damage in the event of a breach, whether as a predetermined lump sum, or by means of a specific calculation or scale of charges . [5]

Damages are the remedy for breach of contract. They are normally assessed when breach occurs, and are designed to be compensatory in nature. Two principles important for assessment of damages are the principles of remoteness derived from the famous case of *Hadley v Baxendale* (1854) in which Baron Alderson said: -

"Where two parties have made a contract which one of them has broken, the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally, i.e. according to the usual course of things, from such breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties, at the time they made the contract, as the probable result of the breach of it"

Damages calculated from these principles are normally assessed after the breach occurs and are known as general or liquidated damages. However, there are disadvantages of such an approach. Firstly, they are difficult to assess, and secondly, Parties to a contract like certainty.

This led parties to include within their contracts remedies for most common breaches. This was particularly so in construction contracts where breaches are very commonplace, particularly in the areas of delay to completion. For the employer, however, the most common breach suffered is late completion by the contractor and here it is possible to make a genuine pre-estimate of the loss and to incorporate the same into the contract as liquidated damages. This is how liquidated damages developed – good commercial practice.

## **2.2. Calculation of Liquidated Damages**

Once the owner has made the decision to include a liquidated damages clause, it must consider the type of damages to be recovered and the calculation method. Whether the project that the owner is contemplating is a single prime or a multi-prime project, when it comes to calculating liquidated damage amounts for inclusion into a particular contract, the owner must know his project and all of its interfaces[6].

The liquidated damage's formula should be a genuine pre-estimate of the likely loss to the Employer resulting from delay in completion of the Works, or any Section of the Works, as the case may be.

There are various methods used to assess liquidated damages. For instance, no construction contracts often specify that the liquidated damages will be (a) a percentage

of the total contract price (b) a percentage of the contract price assessed for each day of unexcused or (c) a lump sum for failure to perform.

Liquidated damages in construction contracts are commonly calculated according to the method, where a stipulated sum is assessed for each day of your delay.

In estimating the likely loss to the Employer, there is a widely accepted formula which includes the following components: [7]

- ✎ Loss of revenue or interest on the capital invested in the project;
- ✎ Supervisory costs during the delay period;
- ✎ The additional sum payable to the Contractor in respect of fluctuations in the cost of labor and materials; and
- ✎ Any special damages specific to the particular project.

### **2.3. Liquidated Damages Clause**

The clauses listed below are used in construction projects to implement liquidated damage, PIDIC 1992 and General condition of contract PPA 2011 respectively.

#### **Liquidated Damages for Delay Clause 47.1**

If the Contractor fails to comply with the Time for Completion in accordance with Clause 48, for the whole of the Works or, if applicable, any Section within the relevant time prescribed by Clause 43, then the Contractor shall pay to the Employer the relevant sum stated in the Appendix to Tender as liquidated damages for such default and not as a penalty (which sum shall be the only monies due from the Contractor for such default) for every day or part of a day which shall elapse between the relevant Time for

Completion and the date stated in a Taking-Over Certificate of the whole of the Works or the relevant Section, subject to the applicable limit stated in the Appendix to Tender. The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any monies due or to become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligation to complete the Works, or from any other of his obligations and liabilities under the Contract.

### **Reduction of Liquidated Damages Clause 47.2**

If, before the Time for Completion of the whole of the Works or, if applicable, any Section, a Taking-Over Certificate has been issued for any part of the Works or of a Section, the liquidated damages for delay in completion of the remainder of the Works or of that Section shall, for any period of delay after the date stated in such Taking-Over Certificate, and in the absence of alternative provisions in the Contract, be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works or Section, as applicable. The provisions of this Sub-Clause shall only apply to the rate of liquidated damages and shall not affect the limit thereof.[8]

### **Liquidated Damages Clause 27.1**

Except as provided under GCC Clause 18, if the Contractor fails to carry out any or all of the Works within the period specified in the Contract, the Public Body may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages the following:



- (a) A penalty of 0.1% or 1/1000 of the value of undelivered Service for each day of delay until actual delivery or performance,
- (b) The cumulative penalty to be paid by the Contractor shall not exceed 10% of the contract price.

### **Liquidated Damages Clause 27.2**

If the delay in performing the contract affects its activities, the Public Body may terminate the contract by giving advance notice to the Contractor pursuant to GCC Clause 21 without any obligation to wait until the penalty reaches 10% of the value of the Contract.

### **Liquidated Damages Clause 27.3**

If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate<sup>1</sup>[9].

where there is a liquidated damage clause in a contract, a major point to consider is to what extent is it possible for either party to avoid liquidated damages and substitute general damages[10].

A liquidated damages clause may be favorable where time is of the essence and the owner runs the risk of incurring what otherwise may be a difficult loss to quantify. A liquidated damages clause may prove to be advantageous where the project is delayed but it is not yet an income generating facility. The liquidated damages clause will enable that

owner to collect the liquidated damages as stipulated in the contract, thereby avoiding a lawsuit trying to recover its damages and instead retrieve the stipulated amount as provided for in the agreement.

It is acknowledged that the Contractor's failure to achieve substantial completion of the Work within the Contract Time provided by the Contract Documents will cause the Owner to incur substantial economic damages and losses of types and in amounts which are impossible to compute and ascertain with certainty as a basis for recovery by the Owner of actual damages, and that liquidated damages represent a fair, reasonable and appropriate estimate thereof. Accordingly, in lieu of actual damages for such delay, the contractor agrees that liquidated damages may be assessed and recovered by the Owner. Such liquidated damages are intended to represent estimated actual damages and are not intended as a penalty, and Contractor shall pay them to Owner without limiting Owner's right to terminate this agreement for default as provided elsewhere herein [11].

#### **2.4. Enforceability of Liquidated Damage Clause**

The widespread and longstanding rule is that these provisions are enforceable when the actual damages resulting from a delay cannot be easily determined at the time of entering into the contract and the amount assigned as "liquidated damages" represents a reasonable estimate of the damages. Putting another way, liquidated damages must be based upon a "reasonable forecast" of loss to the owner if the project is not finished by the stipulated date of completion.

The liquidated damages should be "a reasonable approximation of the actual anticipated damages from the loss of use of the project."

Where the amounts of liquidated damages is a proper estimate and are stipulated as such in the contract, the provision is generally enforceable.[11]

Liquidated damages clauses which have become a useful, commercial mechanism for determining or fixing damages payable by one party to another party under a contract in the event of a default by the first party of its contractual obligations and thereby reduce the risk of litigation between the contracting parties.[12]

A liquidated damages clause (in broad terms) allows contracting parties to pre-set the damages recoverable by an innocent party in the event of a specified breach by the party in default. The benefit of such a clause is that it should be quicker and simpler for a party to enforce its claim under the contract. A party seeking to enforce such a clause simply needs to show that the relevant breach has occurred and does not have to prove he has suffered a loss as a result nor is he under a duty to mitigate his loss (as would be the case under a claim for general damages). [13]

An enforceable liquidated damages provision is meant simply to compensate the non-breaching party for damages that were too difficult to anticipate under the circumstances at the time the parties entered into the contract[14]

Many clauses state that the owner has the right to deduct liquidated damages from progress payments or retain. Languages such as the following may be included:  
The owner shall recover said liquidated damages by deducting the amount thereof out of any moneys due or that may become due to the contractor.

Period of Assessment liquidated damage

Liquidated damages typically run from the planned completion date to the actual completion date in which the planned completion date is omitted and the actual completion date is included

- Starting Date

The starting date for contract performance should be specified in the contract documents or indicated in the notice to Proceed. If no starting date is specified, the date of scheduled completion may be subject to dispute. This can be very significant, since a dispute over the starting point from which to assess liquidated damages against you may be fatal to enforcement of the clauses.

- Ending Date

The endpoint for assessment of liquidated damages is generally the date of substantial completion i.e., the date work is completed to the extent that the owner may use the facility for the purpose intended' Consideration must be given to the quantity of work unfinished and the extent to which the project was capable of adequately serving its intended

At least one case has held that actual rather than substantial completion is required to halt the assessment of liquidated damages. In this case, the project was only partially available for use and the liquidated damages were not high.

### **3. METHODOLOGY**

#### **3.1. Study area**

This case study determines a factor which letsthe Agaro campus lot II construction project to liquidate, and identified effects of the liquidated damages on project. Hence the case study area is located in Oromia Regional State in Jimma zone, in Agaro town. Agaro town is located at 390km from Addis Ababa. Agaro Campus Lot II Construction Project owned by Jimma University. The researcher chose this area since Oromia zone is one of the zones highly emphasizing in infrastructural growth hence being subjected to various construction problems.

#### **3.2. Study Design**

According to Kothari, research design decision shall be in respect of:

- ✎ What is the study about?
- ✎ Why is the study being made?
- ✎ Where will the study be carried out?
- ✎ What type of data is required?
- ✎ Where can the required data are found?
- ✎ What periods of time will the study include?
- ✎ What will be the sample design?
- ✎ What techniques of data collection will be used?
- ✎ How will the data be analyzed?
- ✎ In what style will the report be prepared?[15]

In this case study, a desk research method was employed to assess the causes and effect of the liquidated damage. In doing this, monthly work break down accomplishment report, payment history of the project and relevant data were obtained from the client and researched for the analysis. In addition, the bid award was exploited to obtain any causes why the work got stuck.

### **3.3. Study Variables**

#### **3.3.1. Independent variable**

The independent variables of this specific study are;

- ✎ Payment Utilization
- ✎ Contractor's Scheduling
- ✎ Incapacity of contractor to execute the work

#### **3.3.2. Dependent variable**

The dependent variable of this specific study is;

- ✎ Occurrence of liquidated damage

### **3.4. Data collection process**

The data and information sources are available document (related to the specific contract-Agaro campus Lot II) sources relevant to the case study will be reviewed.

As per objectives of this study, pertinent primary data and information on contract completion time, performance of the contract, payment utilization and advance payment repayment the construction project contracts will be collected from the employer.

The data(quantitative data) of this case study will be collected through desk study, review of various documents such as contract documents, progress reports, contract schedule and payment.It will be used in order to critically evaluate root causesof the liquidated damage in Agaro campus Lot II construction project contracts

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### **3.5. Data processing and analysis**

The primary goal of this case study effort was to insight the cause of liquidated damage Agaro campus Lot II construction project based on project data.The first step is to acquire project data from employer. Using this dataset, it would be possible to determine the cause of liquidated damage on the project based on the contract time, progress and payment utilization. Since the liquidated damage meant to be pre-estimates of a typical project, analysis had to be conducted to purge the Agaro campus Lot II construction project.

#### 4. RESULT AND DISCUSSION

In this case study work, in order to evaluate the causes of the liquidated damage on Agaro campus Lot II construction project data has been gathered from the archives at the employer. The data gathered has been stratified in monthly work planned, monthly work executed, cumulative work planned, cumulative work executed, payment utilization and advance payment repayment which facilitates the detail analysis of the data from different perspectives, that help the identification of the major problems causing the liquidated damage observed on the on Agaro campus Lot II construction project.

**Table 1 Annual Work Planned Vs. Work Executed**

Month	Work planned in%	Work executed in%
month1	5	0
month2	8	0
month3	9	0.16
month4	11	0.1
month5	13	0.44
month6	13	0.25
month7	8	2.79
month8	8	0.5
month9	7	0.07
month10	6	0.88
month11	7	0.47
month12	5	2.34

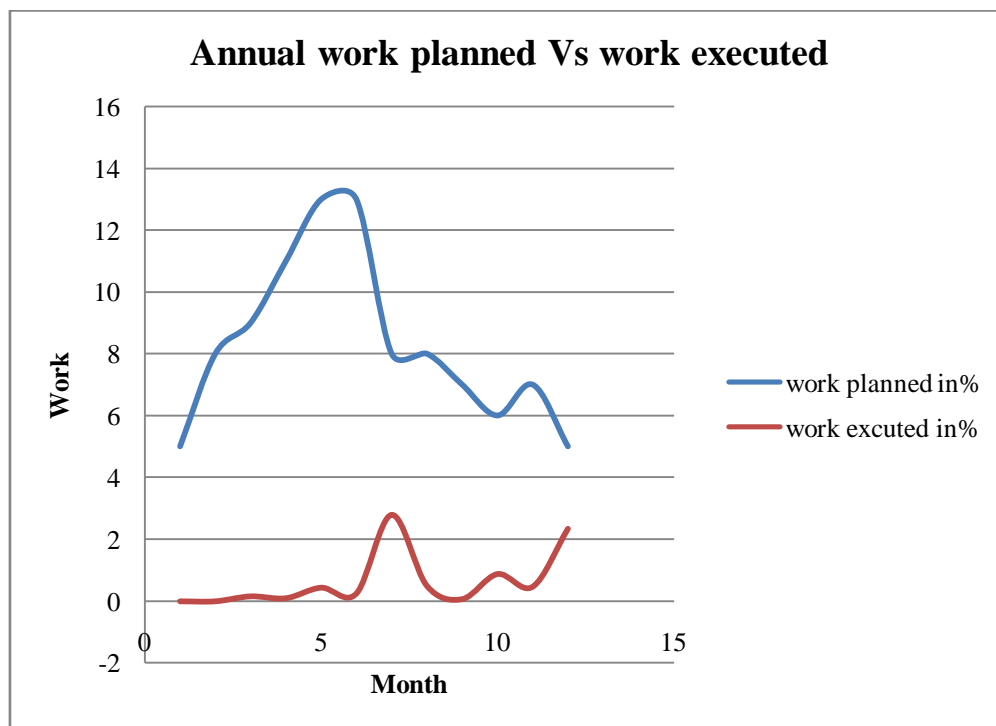
As can be seen from figure 1, the work break down schedule over the entire months of the contract period, 1 year has been elapsed with the execution of below ten percent.



Graphical representation of same result in Figure 1 shows the accomplishment going nearly parallel to the plan irrespective of the huge gap between them and this emphasizes either misuse of the payment or disinterest to work seen by the contractor.

The first two month the contractor did not finish mobilization despite the master schedule shows 13% of the contract time elapsed in addition that 21day for mobilization also wasted.

On the 7th month and 12<sup>th</sup> month the contractors have relatively small progress with respect to the schedule almost 39.46% of work is done.

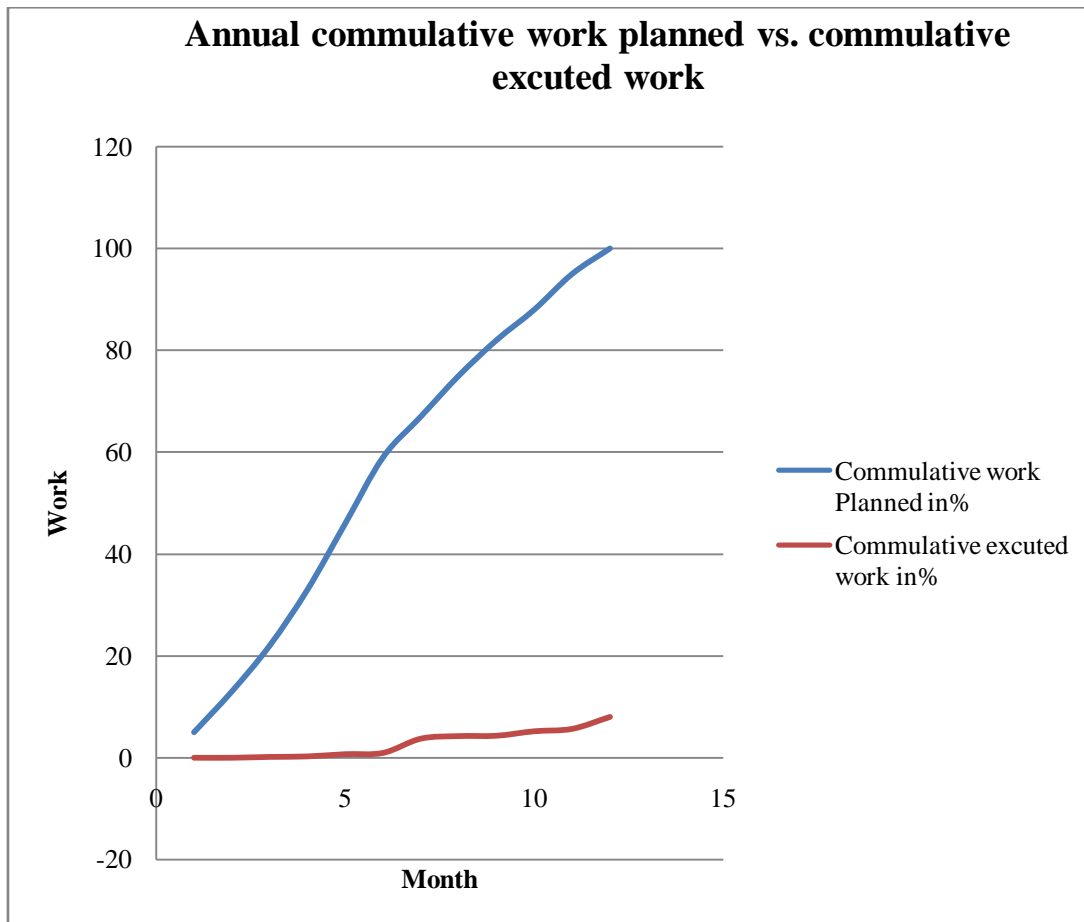


**Figure 1 Annual Work Planned vs. Work executed**

**Table 2 Annual cumulative work plan vs. cumulative executed work**

<b>month</b>	<b>Cumulative work Plan in%</b>	<b>Cumulative executed work in%</b>
month1	5	0
month2	13	0
month3	22	0.16
month4	33	0.26
month5	46	0.7
month6	59	0.95
month7	67	3.74
month8	75	4.24
month9	82	4.31
month10	88	5.19
month11	95	5.66
month12	100	8

The cumulative plan accomplishment Table 2 and figure 2 shows almost the work has not been commenced until the sixth month of the contract which indicates resource were not mobilized accordingly and this lets the complete wastage of the advance payment for the cumulative accomplishment should have been at least good on the startup of the project.

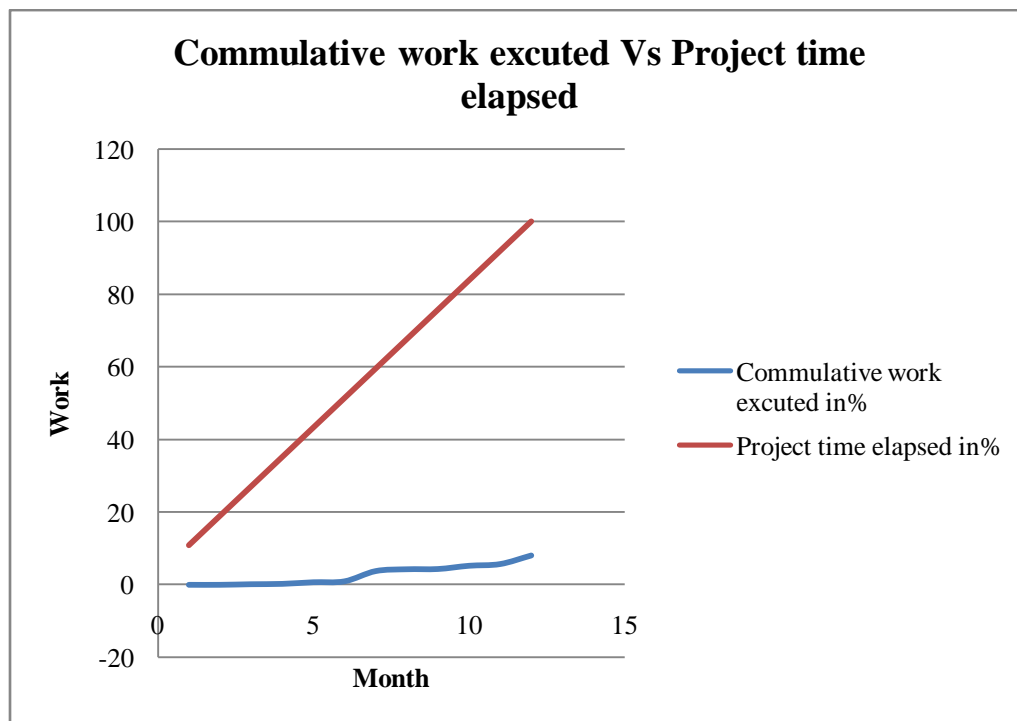


**Figure 2 Annual cumulative work plan vs. cumulative executed work**

Despite the employer expect relatively better progress in the first two to three months the contractor on those times is not finished its mobilization accordinglyfigure 2 clearly shows when the time ticks the contractor is reluctant to handle the sluggish work progress.

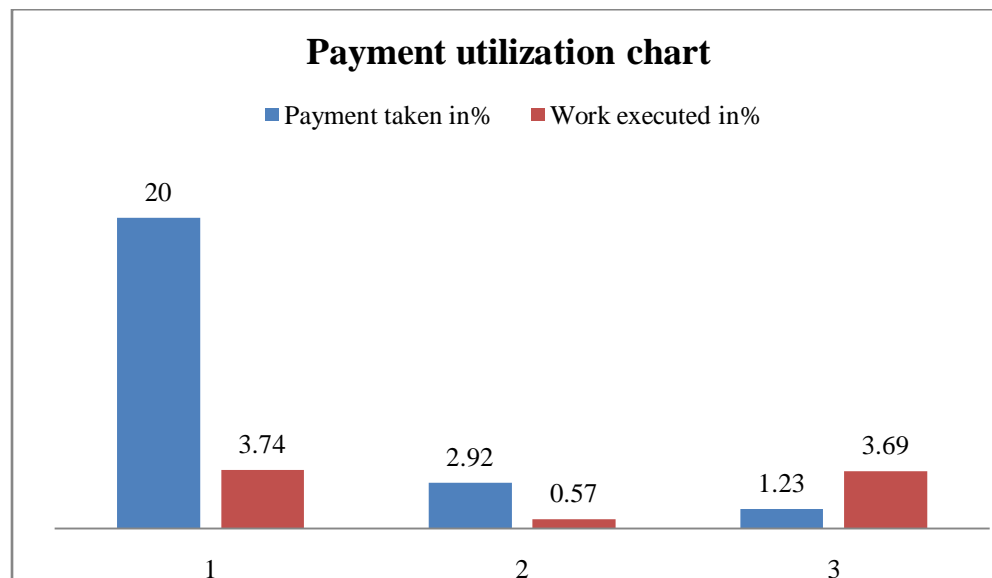
**Table 3 Cumulative work executed Vs. Project time elapsed**

Month	Cumulative Work Executed In%	Project Time Elapsed In%
Month1	0	10.81
Month2	0	18.92
Month3	0.16	27.03
Month4	0.26	35.14
Month5	0.7	43.24
Month6	0.95	51.35
Month7	3.74	59.46
Month8	4.24	67.57
Month9	4.31	75.68
Month10	5.19	83.78
Month11	5.66	91.89
Month12	8	100.00



**Figure 3 Cumulative work executed Vs. Project time elapsed**

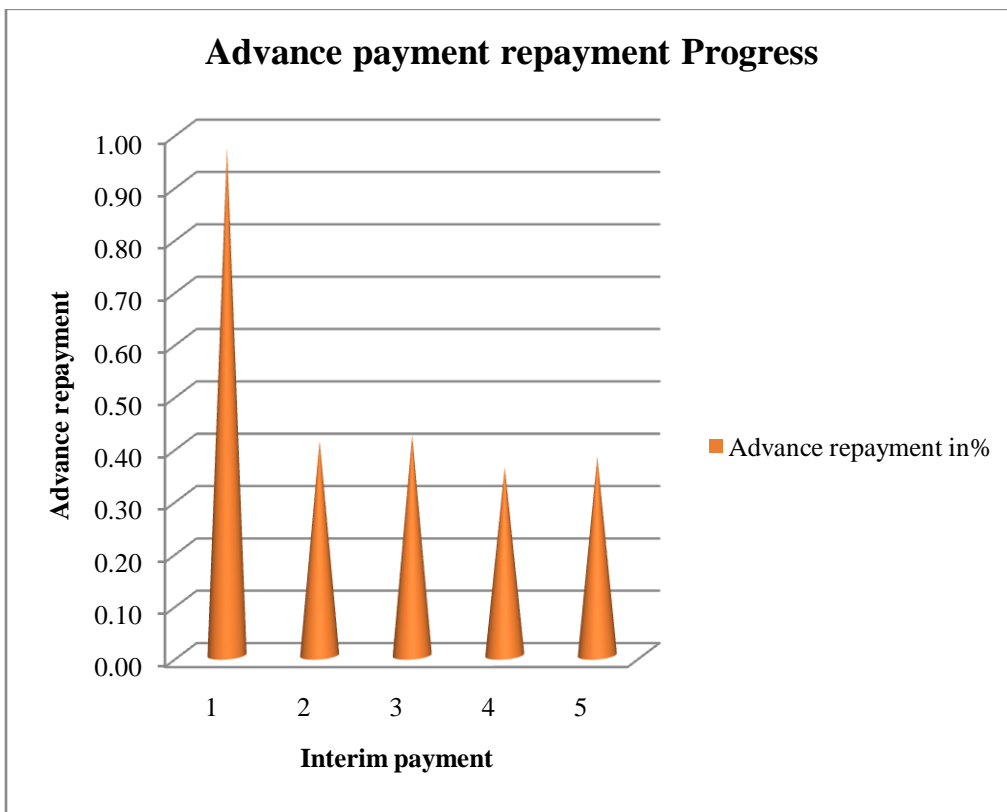
Payment utilization is a paramount subject on assessing the efficiency of the construction project and hence the contractor has taken 20% advance payment and five interim payments in which three of the last payments were paid after the project submission date were expired. As it is seen on figure 4, the contractor took 20% of advance payment and (fig 3 it took the contractor 6 months ) to execute only 3.74% of work until his second payment, which accounts 2.93% work and consequently creating a progress of 0.57%. Finally, the third interim payment which accounts 1.23% of the total project cost and produced 3.69% and the contract period expired afterwards.



**Figure 4 Payment utilization chart**

For this reason the contractor is not producing appropriate marginal work based on the payment he receives, and all went on the contrary and the work execution were a diminishing nature until the third payment which shows a very less sense of urgency as compared to the first two payments.

Figure 4 shows the contractor is not willing to use all the payment he made on this particular project to the subsequent work at least to minimize the damage specially the liquidated damage. An amount of the Advance payment 20% work is not executed even if the contractor took 4 payments after the advance payment.



**Figure 5** Advance repayment Progress

Generally the contractors were supposed to repay 25% (this is because in this particular project the advance repayment should be finalized when the work progress reaches 80%) of the executed amount until the whole amount of the advance payment (20% of the project cost) is reimbursed. However some kind of advance payment misuse can be ascribed for the very poor advance repayment of the contractor as seen in figure 5.

Advance repayment is directly related to the progress of the project, when the progress increases the advance repayment increases and vice versa.

## 5. CONCLUSION

This case study has examined the main causes how the contractor faced the maximum liquidated damage on three different cases, where the first was to assess the relation of the planned work to the executed amount over the entire period. As a result the progress graph went parallel to the planned amount irrespective of the huge gap between them. Therefore, this shows the contractor doesn't have the capacity to accomplish this construction project.

Secondly, payment utilization method identified diminishing marginal progress for every payment were made which is hugely attributed to payment misuse because the contractor should have at least produced as much work as the payment made.

Thirdly the advance payment repayment graph shows the contractor used to reimburse very small amount, 7.63% as compared to the advance payment, 20% which were given to him and this shows the contractor has no intention of going along the project rather needing to be terminated before complete advance payment repayment hope of winning on the termination scenario.



## **6. RECOMMENDATION**

Since the construction activity after the advance payment till the first payment took almost half of the project contract time elapsed clearly shows the contractor disinterest and/or incapacity to the work, expecting the positive work progress to come until the contract period has expired so as to take legal contractual action afterward (Liquidated damage) doesn't help the client (Jimma University) and need to act in early stage of the of liquidated damage.

The liquidated damage imposed on the contractor very challenging to enforce easily because the contractor will not refund accordingly the client should ready the legal may process takes additional time take proper caution for other project.

For this reason early termination by negotiation should have helped the stakeholders especially to Jimma University and should be practices for any other project that have similar situation.

## 7. REFERENCE

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