

Construction industry is expanding regularly construction essay



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ABSTRACT This research presents results of a study on "Necessity for minimize variations to avoid project delay in construction industry". In a Construction industry, Construction project is a temporary endeavour to create a unique product or service. Every project have a clear, definitive objective and activity tasks, generally the construction project manager is a responsible person to the overall project. Client is the project owner or investor of the investment, design team, Consultants or management teams engage with project as per the requirement of client. Finally selected contractor legally bind with the Contract to build and successfully complete the project within schedule, cost and Quality. In a Construction project, Variations are much common in most Contracts due to incomplete Drawings, Specifications, Bill of Quantities and other Contract Documents. And also due to lack of information from the Client to the Consultant with regards to the Project, lead to Variations. This situation inevitably generates unnecessary project delays and disputes. Therefore it is an essential requirement to find ways to minimize the possible occurrences of Variations in a Contract. The research methodology employs to achieve the research objects through the complete literature Survey to explore type of variations and identify the causes for occurrence of variations & mitigation actions (using Books, Web Articles, Magazines and specific researches & findings done by different professionals) and Collect and Study data of Dubai based project that involved in variations work to identify causes to Project delays due to variations. Also carry out discussions, interviews and Questioner Surveyor, etc; with various professionals working under contractors and clients in construction projects, to analyze and identify the necessity of minimize variations to avoid project delay incurred due to Variations and necessary

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mitigation actions. In this research of 'Necessity for Minimize Variations to avoid project delays' is conducted as a part of Author's fulfilment for BSc degree programme in Quantity surveying and Construction management, at Sheffield Hallam University, UK. The reason why the Author selected this research is to understand the various causes for the construction delays and to share the research work with construction community. The author believes that, it would be an assistance to mitigate unnecessary expenses due to construction delays in the industry. Keywords: Standard form of building contract, Owner, PAM 1998, Variation Orders. GLOSSARY OF TERMSSMM7 - Standard Method of Measurement 7CESMM3 - Civil Engineering Standard Method of MeasurementFIDIC - Federation Internationale Des Ingenieurs-ConseilsJCT - Joint contract TribunalICTAD-Institute of Corporation Training and DevelopmentPMBok- Project Management guide bookAED / Dh- Arab Emirates Dirham

CHAPTER 01 - INTRODUCTION

BACKGROUND

The Construction industry is expanding regularly everyday due to various reasons such as developments, increase of populations etc. However there are limited resources available in the world to use for constructions (Faisal and Low). The complexity of the construction industry due to different stakeholders' participation makes it change from other industry. This complication gives rise mostly to unwanted condition like variations with their attached effects, and the more variations on a project, the greater the possibility that they become time consuming and costly in construction projects as stated Mohamed in his 2001 report (Ayodeji 2010). The most

fundamental objective of a client in a project is to achieve a successful project, a project that has been correctly planned, designed and constructed in accordance with plans and specifications, and completed within time and cost originally anticipated (Stanslaus 2011). The Chamer in his 1990 report described as " Time is an extremely important issue in construction, together with cost and quality, it is a primary objective of project management, and a major criterion by which the success of a project is judged (cited in John and Will 1998). The construction projects are typically unique in terms of the final products and the parties who are involved in the project. Typically over 1000 activities are involved in a medium size construction project, which can increase the unpredictability of project schedule and planning. Uncertainty circulates in a project as each activity is influenced by other upstream and downstream activities (Kiavash, Hazhir , Ali Haghan 2010). The projectIn a Construction Industry, Project is a temporary endeavour to create a unique product or service. Every project have a clear, definitive objective and activity tasks, also the construction projects are complex in terms of the number of the activities and parties that are involved in the project and their relations (PMBok 4). Generally the construction project manager is a responsible person to the overall project. The Client is the project owner in the Construction project, and Design team, Consultants or Management teams engage with project to implement project objectives in accordance with the contractually bind. As well as selected contractor legally bind with the Contract in accordance with requirement of contract agreement to build and complete the project successfully within the schedule, cost and quality. As examples for Construction Projects; such as Infrastructure works,

Industrial Buildings, Railways and highways, Dams, Residential Complex, Bridges, etc;

The Contract

A Contract is an agreement formed between two or more parties that is intended to be legally enforceable, should have following essential elements. Such as, Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance. (FIDIC 1987). Under the general law of contract, when a party makes an offer to provide goods and/or services for some certain consideration and the party to whom the offer is made accepts it, then, provided it does not involve any illegal act, a contract which is enforceable at law exists"(Jack Ramus, Simon Birchall and Phil Griffiths 2006).

Influence of Contract Documents for the Contract

There are specific Contract Documents that have been used in Construction industry some are vitally important to form a contract and maintain a contract avoiding cost and time overruns due to variations and Extension of Time until the end of contract period. The Contract documentation is the means by which a designer's intent to convey to the client, the legislative authorities, the quantity surveyor, the contractor and the sub-contractors (John Murdoch and Will Hughes 2000) . The contract documents includes, practically all the standard-form contracts make out the articles of agreement, conditions of contract, appendix, drawings and bills as key contract documents. However, there are differences between forms when it comes to such items as programmes, specifications, etc. (John Murdoch and <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

Will Hughes 2000) . Furthermore study about the Contract document according to the " Contract Practice for Surveyor" (Jack Ramus, Simon Birchall and Phil Griffiths 2006) they noted in it as follows. Form of ContractIn older days used JCT form of Contract (Joint Contract Tribunal) as principal document, and in these days principally use FIDIC form of Contract or as other form of contract such as NEC form, ICTAD form of contract in Sri Lanka.

Conditions of the ContractThe condition of contract document set out the duties and rights of the parties, and the detailed conditions as per the standards condition of contract Such as the JCT Form, FIDIC Condition of Contract and ICTAD Condition of Contract (51. 1, 51. 2, 52. 1, 52. 2, and 40. 1 of FIDIC Red Book).

Bills of QuantitiesA Bill of Quantities facilitates to price a contract especially for contractor since all the materials and works to be carried out are listed. Basically variations are occurred due to inadequately prepared BOQ. The standard methods of measurements; such as, POMI, SMM7, CESMM3. etc; are used as benchmarks for taking-off measurements.

Project SpecificationsGenerally project specifications consist with technical and workmanship requirement which have to be fulfilled in construction project. This requires planning to make sure a construction project is successfully completed (Manda Gilbert 2013). Hence some changes of the specifications; it will effect to create variations to the project as well.

Project DrawingsBasically Project Drawings are provided with detailed for site location, position of the building, access to site, floor plans and elevations. Therefore some changes of details which mentioned in drawings, it will be a reason for variation arises to the project.

Schedule of RatesWhere Bills of Quantities are not provided, a Schedule of Rates is usually used as a basis for pricing the work, As well as for pricing of variations especially in Lump

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Sum Contracts. Schedule of worksParticularly as an alternative to a specification in the case of 'without quantities' contracts tenderers may be supplied with a Schedule of Works. This lists the work comprised in the contract under appropriate headings. The tenderers may be required to price the schedule. The Contract Documents are highly important part of the Contract; however, if there are ambiguities, discrepancies or contradictions in contract documents, hence improper contract documents directly create variations to the project during the construction period, it may lead to delays of the project.

The contract sum

The price stated in the owner-contractor agreement, which is the total amount payable by the owner to the contractor for the performance of the work, The main reasons for alterations of the contract sum for which the Conditions create provision are: the adjustment of provisional sums; variations to the design; additions or reductions to the scope of the work, loss or expense incurred by the contractor for specified reasons and increases or decreases in the costs of labour and materials or in taxes, levies or contributions imposed by Government. (Jack Ramus, Simon Birchall and Phil Griffiths 2006)

Method of Contracts

There are different types of Method of Contracts are used by different clients and consultants in construction industry such as, Traditional method, Re-measure contracts, Lump sum contracts, Cost reimbursement contracts, Cost plus percentage, Cost plus fix fee, Cost plus variable fee, Design and build contract, Management path, etc. The Clients and consultants use to <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

select a suitable type of contract for a project according to the project complexity, value of the project, construction duration, client's requirement etc (Jack Ramus, Simon Birchall & Phil Griffiths 2006).

Importance of Study

The Contract variations are much common in most Contracts due to incomplete Drawings, Specifications, Bill of Quantities and other Contract Documents. And also due to lack of information from the Client to the Consultant with regards to the Project, lead to Variations. This situation inevitably generates unnecessary project delays. Therefore it is an essential requirement to find ways to minimize the possible occurrences of Variations in a Contract.

Scope of Research

This study critically analysis the type of variations in constructions projects, Identify key elements that cause to occurrences of project delays that incurred due to variations and investigate how to mitigate/ avoid the variations in construction projects. The research methodology utilizes to achieve the research objectives through the complete literature Survey towards identifying of what are the variations in Constructions Projects. As well as find-out methods that are being used to mitigate the variations in construction projects using different sources (case study), carry out discussions, interviews, etc; with various professionals working under contractors and clients in construction projects.

Aim & objectives

Aim of this research is to identify "Necessity for minimize variations to avoid Project delays incurred due to Variations in a Construction Project". The main objectives of this study included the following: Explore the type of variations in constructions projects. Identify key elements that cause to occurrences of project delays that incurred due to variations in the construction Projects. Investigate how to mitigate/ avoid the variations in construction projects.

Methodology

To suit the hypothesis and achieve the objectives of this research a two stage approach was taken as stated below; Secondary dataExplore type of variations and identify the causes for occurrence of variations & mitigation actions through the complete literature Survey (using Books, Web Articles, Magazines and specific researches & findings done by different professionals). Primary dataCollect and Study data of Dubai based project that involved in variations work to identify causes to Project delays due to variations. Carry out discussions, interviews and Questioner Surveyor, etc; with various professionals working under contractors and clients in construction projects, to analyze and identify the necessity of minimizing of variations to avoid project delay incurred due to Variations and necessary mitigation actions. In addition this research methodology, it could be described by below given Diagram as well.

LITERATURE REVIEW

Investigate type of variations, Causes & mitigation actions by using of Books, Web Articles, Magazines and other Resources.

DATA COLLECTION

Project data, Discussions, Interviews and Questioner Surveyor, etc

CONCLUSION AND RECOMMENDATIONS

Literature review. Discussions, Interviews and Questioner Surveyor, etcThe research methodology used to achieve the above aim, objectives is explained in next chapters.

CHAPTER 02 - LITERATURE REVIEW

Introduction

This chapter identifies previous literature on the subject of variations and provides a brief discussion of past findings to achieve the objectives of this research. Such as try to explore type of variations and identify effect causes to occurrences & mitigation actions within particular sources of data obtained reading material such as specific books, magazines, Articles, journals, web sites and specific researches & findings done by different professionals relevant to the topic of variation.

Explore the type of variations and Identify key elements that cause to occurrence of variations.

Explore what is the Variation?

General DefinitionsAccording to the Oxford English Dictionary defined, " A variation is something which deviates from a former or normal state, standard or type" (Oxford, 2001). Variations in construction contracts can mean changes to the terms of the contract or it can mean changes to the scope or character of the works (Lim Chuen Ren 2013). However variations to the scope of construction works are necessary, because no project is

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perfect and changes are required to meet unforeseen circumstances or changed requirements. Thus, Variations can be in the form of additions, omissions or substitutions (Lim Chuen Ren 2013). According to the definition of FIDIC 1987, "The Engineer shall make any variation or the form, quality or quantity or the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be appropriate he shall have the authority to instruct the Contract to do and the Contractor shall do any of the following" (FIDIC 1987). As defined in JCT 98, Variation order involved additions, omissions, alterations and substitution in terms of quality, quantity and schedule of work (cited in John and Will 2000). The ICE definition of a variation appears in clause 51. It includes additions, omissions, substitutions, alterations, changes in quality, form, character, kind, position, dimension, level or line, and changes in any specified sequence, method or timing of construction. (cited in John and Will 2000). When discovered through the definitions that mentioned above, there is no single definition of what constitutes a variation. Generally, Variations are common in all types of construction projects. After a contract has been signed it cannot be changed or varied by the parties. However, given the nature of the construction process, with all of its inherent risk and uncertainty, most standard forms of construction contract include the provision for variations or alterations to the works (Cartlidge 2009). A variation instruction will frequently direct to claims from the Contractor for additional payment and for an extension to the period for completion. The additional payment may consist of additional costs for delay, acceleration and/or disruption associated with the variation. Variations are one of the main reasons for cost and time overruns in construction contracts (© NSW 2008). In a Construction <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

project, Variations are much common in most Contracts due to incomplete Drawings, Specifications, Bill of Quantities and other Contract documents. And also due to lack of information from the Client to the Consultant with regards to the Project, lead to Variations. This situation inevitably generates project delays and disputes. Furthermore, about variations will be discussed onward within related standards clauses. Initiation of variation Generally variation can issue at any time, using a standard document. It is common, though, for variations to be made by issuing amended drawings, in a letter, or even by verbal site instructions, and so most types of contract also allow the contractor to initiate a variation request (Estate 2006) The most contracts exercise very common standards documents for issuing the variations, except specific government institutes, they employ own particular procedures and standards documents. In addition, the contractor have to keep a careful check on all drawings, information and details received and note any change from the contract drawings. It is on these that the price is based and settlement of any additional costs will be required. The contractor must request a variation for changes as soon as he is or could reasonably be aware of the change, as any delay in submission could affect his right to payment. (Estate 2006). However, the engineer issue instructions from time to time involving variations which the contractor is required under the terms of the contract to fulfil with. Any modification to the works must be the subject of variation orders which constitute an instruction from the engineer to the contractor.

Identify type of variations in Contract

Introduction

A Variation may arise in construction in various ways. It arises more often during the progress of work and rarely before the commencement of the work. Variation in construction industry will lead the impact to all parties involved in this sector. The main implication of variation is in term of time overrun and cost. Most of the variation occurs when major changes in the contract during construction works. Although Variation can identify in many different types depending on the basis and the purpose of categorization. In this review, the most common types are presented. Changes in a construction project can be classified based on the cause that forced them.

Useful variations

Useful variations are necessary in order to minimize adverse effects due to unexpected events or circumstances. They may be required to avoid health, safety or security problems. They do not result in a change to the scope of the work (NSW 2008). Examples of unavoidable variations are: To minimise the increase in cost or other adverse impact of a hidden condition (for example unanticipated ground conditions, hazardous materials or existing services). To overcome a fault (for example an error, ambiguity or inconsistency other than an omission or lack of completeness which may be the responsibility of the Contractor) in the Principal's design or documentation which, unless it is remedied, could result in health, safety or security problems or prevent work from continuing. To overcome a change in statutory requirements that has occurred since tenders closed. According to the " Construction project Administration of Mississippi" harmful variations

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get worse the project outcomes, as frequent Harmful variations can be describe as follows; Change in Scope – Client or Designers request a design changes, Unforeseen Conditions – Site Condition differ from the expected, request by contractor or professionals, Professional errors and omissions – requested contractor or professionals, Errors –Professional has incorrectly drawn the design plans and specifications, Omissions – Professionals has inadvertently omitted and item or element from the plan. A failure to provide an instruction in the above conditions may prevent the Contract from being completed and may therefore is a breach of contract by the Principal. The client has to be made aware of the effect of failing to respond on time to situations generating unavoidable variations. If an instruction is not given on time in response to the situation giving rise to the necessity for the variation additional extra costs will often be incurred, such as delays or rework (NSW 2008).

Identify possible Causes of occurrence of Variations in Contract

Variations occur for a variety of reasons. Some are foreseeable, others are not. Some result from a genuine change of circumstances and others from the design team's own inadequacies. There are many reasons why variations occur, several studies deal with variations and how variations effect with occurrences of Project delays and disputes on the project. According to the research of the " Effective Management of Contract Variations using a Knowledge Based Decision Support System" (Faisal, Low) they have identified comprehensive possible causes of variations and effect of them. Those can be described by below given table; Owner Related VariationsAs

per the research of " Dr Faisal" noted, the Owner who create variations as per his requirements of changes of project objectives. As examples; Changes of plans or scope, Changes of schedule, Owner's financial problems, Inadequate project objectives, Replacement of materials or procedures, Impediment in prompt decision making process, Obstinate nature of owner, Change in specifications by owner.

Consultant Related Variations The Consultant who initiates the variations with subject to the necessary changes due on activities, in some cases, the consultant directly initiates variations or the variations are required because the consultant fails to fulfill certain requirements for carrying out the project. Change in design by consultant,

Contractor Related Variations The Contractor who creates the variations in accordant to the practical reasons, the contractor may propose variations to the project, or the variations may be essential because the contractor fails to fulfill certain requirements for delivery of the project. Lack of contractor's involvement in design,

Other Variations As per the research of " Dr Faisal" that identified as other variations, the effects of variations are not directly related to the participants. Weather conditions, Safety considerations, Change in government regulations, Change in economic conditions, Socio-cultural factors, unforeseen problems, etc; In contract document provide reliable guidance and clear definition of responsibilities for employees, material requirement, details of work, procedure and for coordinating all sections of the work under the contract document. Errors are mistakes made in the design. Problems in bad design of the project always occur especially when there is poor communication between client and consultant. The client dissatisfied with the design made by the designer. In addition, the discrepancies between the works and statutory requirement are one of the

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factors of influenced of instruction of variations. There is a provision in the contract that allows the contractor to make variation to comply with the requirement of the law and local authorities. Extra works are necessary when the contract is lacking a contract item to complete an item of work as specified in the contract. For example, when there is not enough suitable on-site material to build an embankment, a new contract item for the required borrow would be added by variation to complete the work.

Identify the effects of Variations in Contract

Variations during the project may affect the project progress and quality. Time has and the same monetary value even if the professional team tries its best to keep the project completion schedule intact. However, only major variations during the project may affect the project completion time. The contractor would usually try to accommodate the variations by utilizing (Faisal, Low). The effects of variation on construction projects were observed by many researchers and quoted by Faisal and Low in their study according to the research of the " Effective Management of Contract Variations using a Knowledge Based Decision Support System" (Faisal, Low), they have identified comprehensive possible causes of variations and effect of them. Hence, they have identified major reasons are as follows; Potential effects of variation orders. There are significant effects of variations they have identified by their researches, such as, These mentioned effects would be significantly varied by each project scope due to each project has different type of objectives. However, finally those effects will arise to any result to the project Time, Cost, Quality and Health and Safety circumstances. Cost overruns. Arain & pheng 2005 defined, various studies have revealed that

variations contribute to construction cost overruns, the more the variation orders, the more they affect the overall construction delivery cost according to his study, cited in (Ndiokubwayo 2000). The occurrence of variation orders has direct and indirect cost implications; direct costs constitute the additional costs incurred to perform the activities of the current variation.

Figure 5. 2 Project S-curve

In addition when study the cost of variations; require study through S-curve factor, In Figure 5. 2, the cumulative budget projections have been plotted against the project's time duration (used ongoing project data). The S-curve figure represents the project budget baseline against which actual budget expenditures will be evaluated. To observe the status of a project using an S-curve, the cumulative project budget expenditures to date are compared with the actual spending outline at the end of each time period of interest. Any significant deviations between actual and planned budget expenditures constitute a potential problem area that must be investigated (Venkataraman and Pinto 2008). Quality degradation

If variation orders are frequent, they may affect the quality of works. Quality may be compromised because contractors tend to compensate for the losses incurred to variation orders, cited in (Ndiokubwayo 2000). Health and Safety

The occurrence of variation orders can affect health and safety condition. This is because change in construction methods, materials and equipment may require additional health and safety measures as per Arain & Pheng 2005, cited in (Ndiokubwayo 2000).

Standards Clauses related to Variations

In construction industry, use of standards Conditions of Contract clauses are vital requirement for the projects successes due to its provide well-built contractual relationship with many benefits to contract, and protect inherent potential contract disputes and leads variations. In order to change the specification of the work, a contract would, in principle, have to be renegotiated. To avoid this, most contracts include clauses facilitating the employer's design team to differ the specification. Such provisions are usually called variations clauses (John and Will 2000). A variation becomes part of the contract and all the contract condition apply to the changed works, including provisions for extensions of time and site condition. Without contractual clauses, the building contractor would have to agree the erect without any change the building shown on the drawings and represented in the bills for a contract sum. There are comprehensive standards condition of contract document issued by reputed institute, such as FIDC, ICTAD, JCT and private companies own conditions. FIDIC 1987 Red Book FIDIC is an international agency that formulates conditions of contract recommended for construction works where tenders are invited on an international basis. FIDIC conditions of contract are also widely used in domestic projects with minor modifications." Variation" means any change to the Works, which is instructed or approved as a variation, refer to " Clause Variations and Adjustments" (FIDIC 1987). The study of clauses of FIDIC Red book, 1987 4th edition referred to the variations for further identifying the necessity to minimize variations and to avoid project delays; it shows under the Variation clause as follows; Clause 51. 1 Alterations, Additions and Omissions (FIDIC 1987), Clause 51. 2 Instruction for Variations (FIDIC 1987), Clause 52. 1 <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

Valuation of Variations (FIDIC 1987), Clause 52. 2 Power of Engineer to Fix the Rates (FIDIC 1987), Clause 52. 4 Day works (FIDIC 1987), Clause 53. 1 Notice of Claims (FIDIC 1987), Clause 53. 2 Contemporary Records (FIDIC 1987). Furthermore explaining within FIDIC Red book (1987), it says under the Variation clause 51. 1 as follows; FIDIC 1999 Silver Book The Contractor is often put in a difficult position because he must execute each variation unless he promptly gives notice that he cannot implement it because of lack of goods, increased risk to safety or suitability of the time duration or to his ability to meet Performance Guarantees. Obviously the more sketchy the Employer's Requirements and the Works are described in the contract; the less likely it is that the Employers Comment will be seen as a change to the Employer's Requirements or to the Works. However, if the Employers Comment does require a distinct change, the Contractor should write to the Employer asking him to confirm whether the comment amounts to an instruction to change the Works under Sub-Clause 13. 1. When Employers Comments are deemed not to amount to a change or variation then this is a more problematic area. The Contractor may choose to argue that the provision under the Conditions of Contract which allow the Employer to comment do not provide that the Employer can comment when the Contractors Documents conform with the Contract or the Employers Comments. Sub-Clause 5. 2 only allows the Employer to give notice to the Contractor if a Contractor's Document fails to comply with the Contract. JCT 05 The JCT 05 Standard Building Contract (clause 5. 1) defines the term 'variation' as: Variations may arise in any of the following situations (Ramus, Birchall and Griffiths 2006). the contract bills does not provide the information required by The JCT contracts allow for extension and adjustment

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of the completion date by the contract administrator under certain circumstances. These circumstances or events include where the extra works have been ordered. The JCT standard Contract 05 allows for extension of time where the contract administrator gives instructions relating to provisional sums, action regarding fossils, antiquities and testing the work. Where there are approximate quantities only, specified further time may be allowed if the approximation is not a reasonable forecast of the works required (Coleman 2009). Most contracts also state that all such instructions shall be in writing. Clearly a variation can change not only the work itself but also many of the contractor's obligations under the contract. Note, however, that it is the contractor's obligations that can be varied, not his rights, and the ability to make changes does not apply to the terms of contract – these can only be varied by agreement between the parties. The variations clauses which come out in most standard forms of contract is very important from the employer's point of view where the contract gives for the contractor to construct the works described in the contract for a lump sum. In the absence of a variations clause the contractor's obligation will be limited to completing the work described in the contract and there will be no obligation to undertake any variations or additional work. It has been argued that if the work is necessary to complete what is described in the contract then the contractor in relation to a lump sum contract will be obliged to undertake the work even though it may not have been referred to in the specifications or shown on the drawings. Thus, without a variation clause, the contractor would be entitled to refuse to make any alteration in the work, and the employer would effectively be in breach of contract and liable to pay damages if he varies the work. The courts do not imply a variation clause to

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be necessary in order for the project to be completed. A comprehensive clause is therefore usually essential, covering all the likely situations where variations will be permitted in the contract (Estate 2006) .

Value of Variations

Generally, Quantity Surveyors are involved in dealing with variations that may arise within contracts with regards to, (Jack Ramus, Simon Birchall, Phil Griffiths 2006). Identification of required variations, Immediate measurement and valuation of any variations / additional works, Advising on the cost implications of variations, Agreeing contract variation. The measured quantities of the variation may be valued in accordance with any of the following methods as mentioned in " Contract Practice for Surveyor" (Jack Ramus, Simon Birchall, Phil Griffiths 2006). They are: by the inclusion in the variation accounts of a lump sum in accordance with a quotation submitted by the contractor and accepted by the architect, by pricing measured items in the variation accounts, by ascertaining the total prime cost of additional work and applying appropriate percentage additions. Under most standard forms of contract in the construction industry where Bills of Quantities are adopted the valuation of variations are generally made by Quantity Surveyors in accordance with four main valuation rules. The measured quantities of the variation may be valued in accordance with any of the following methods; Rates contained in the Bills of Quantities or Schedule of Rates, whichever is applicable On the basis of rates analogous to those above On the basis of a fair valuation, at fair rates or prices At Day work rates at the prices ruling at the date the work is actually carried out The Engineer issued variation orders, then Contractors' Quantity Surveyor takes off

variation order quantities and calculates the affected variation amount of the contract sum; and Consultant Quantity Surveyor and the Client's Quantity Surveyor will finalise the Contractors' Cost Submissions in accordance with the Clause: for Variations in Contract Agreement. An Employer on the other hand argue that the purpose of clause 52. 3 (Variations exceeding 15%) is to compensate the Contractor, if appropriate, provided there are serious difference between the estimated and actual quantities (FIDIC 1987).

Identify of Delays and claims due to Variations

Construction delays define in various ways. relates construction delay to progress compared to baseline construction schedule while and summarized that a delay is when there is time overrun or extension of time to complete the project. Generally a delay is a situation when the actual progress of a construction project is slower than the planned schedule (Abdullah, Azis and Rahman 2000). Bramble B. B., and Callahan M. T (2000) defined, the delay can be grouped into three types as follows, cited in (Abdullah, Azis and Rahman 2000). Ogunlana S. O , Promkuntong K, Jearkjirm, V(1996) and Chan D. W. M. and Kumaraswamy M. M (1997) stated, for the past 15 years, extensive research works on construction delay had been carried-out throughout the world. The main cause of construction delay in high-rise building construction projects in Bangkok, Thailand are; frequent changes by owners. While a comparative study of causes of time overruns in Hong Kong construction projects revealed that common causes of delays were: unforeseen ground condition; low speed of decision making involving all project teams; client-initiated variation and necessary variation of works (Abdullah, Azis and Rahman 2000). Claims for extensions of time (Due to

Variations)Extension of time (EOT) claims An EOT claim is one in which the contractor claims for an extension of time to his contract duration, and/or additional costs associated with the extension, because of critical delays to the programme which were not his responsibility. An EOT claim arises from critical delays only; non-critical delays do not give rise to EOT claims. However, there could be disruption claims arising from non-critical delays. EOT claims are one of the most common claims and are very important for contractors and employers alike (Raj 2009). A further application of the issue is whether automatic changes in quantities would lead to variations in relation to extension of time. Under clause 44. 1 (Extension of time for completion), " the amount or nature of extra or additional work" is the base ground for extension. It may be arguable from the Employer's side that although no express statement of variation is made in clause 44. 1, the relationship between clause 44. 1(a) and clause 51. 1(a) in their wordings and (e) is sufficient to make it plain that extensions of time can be granted for variations depending upon the use of float available in the program. EXAMPLE 2 (Assumed)not the 4m²/hour assumed in the tender. That is, a loss of 1/6 hour/m², not the 4m²/hour based on tendered data (Estate 2006).

Investigate how to mitigate/ avoid the variations in construction projects

According to research of " The potential effects of variation orders in construction projects" Zulkfli OSMAN, Abdelnaser OMRAN, Choo Kim FOO School of Housing, Building and Planning, Universiti Sains Malaysia, MALAYSIA identify mitigation action forProper management of variation

orders or project planning. Variations can be minimized if the designs by the consultant are thorough and meticulously detailed.

Chapter 01 Summary

A Variation is generally defined as the Alteration or Modification to the Design with the effect of Quality or Quantity of the Contract Works. It lead to Project Delay such as Cost Overrun along with Time Extension, The Engineer may issue Instructions in accordance with the Standard Condition of Contracts such as referred to FIDIC, JCT , ICTAD, etc; The issue of Variation Order Instructions ensures that Quantity Surveyors' Variation Order Value Submission is required, so as to determine Clients' Monetary Effect. Foreign

CHAPTER 03

METHODOLOGY

Introduction

The methodology of research is vital in directing the researcher to accomplish the aim and the objective of the study. This methodology chapter will illustrate the methodology process was to ensure that the information obtained for this research was relevant and capable of qualitative assessment. The Research plan ties up the entire features in a research project together.

Research process

Research process is a systematic development of analysis planned to understand, gather and improve facts. This intellectual investigation procedure produces a greater understanding of problems and makes practical applications through theories, questioning and reasoning to achieve

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the research objectives hoping to produce some new knowledge. Generally, research procedure is understood to follow a certain structural process. Though step order may vary depending on the subject matter and researcher, it could be described by below given Diagram as well.

LITERATURE REVIEW

Investigate type of variations, Causes & mitigation actions by using of Books, Web Articles, Magazines and other Resources.

DATA COLLECTION

Project data, Interviews and Questioner Surveyor, etc

CONCLUSION AND RECOMMENDATIONS

Literature review. Interviews and Questioner Surveyor, etcFigure 3. 2:

General Research ProcedureThe research objectives were specifically design where it is systematically divided in three stages in consecutive sequence such as Literature Review, Case Study and Questioner & Interviews.

Literature Review

Method used in conducting this research starting with literature review where the first section explained and discussed the type of variation and second section discussed about the causes/effect of variation which begin with the definition of variations. The source of data obtained from the reading material such as books, magazine, article, journal, web site and other published information supporting the topic of variation order.

Case Study (Document base)

In the case study will be discussed for a past large scale construction project in Dubai base. Both qualitative and quantitative data will be collecting from the case study. The aim of the case study is identify how Variations are effected to the project, during the constructions period. Following things are expected to identify through the case study. Explore the selected project particulars as exacting details and relevant information from being available documents. Identify the involved parties for origin of variations, specially consider issued instructions for originate of variations either by Clients or Consultants or by Contractors. Study the causes to occurrences of variation analyze them with involved parties, base on available data of selected project. Study the effects that occurred due to variations such as Cost overrun, Time Overrun. Analysis findings of case Study to identify the final outcomes of this case study as what causes are generating and affect them for project delays due to variations. InterviewsThe interviews will be conducted by the Researcher as face-to-face mode to obtain primary qualitative data. 3 nor of semi structured interviews will be conducted with selected professionals working in Dubai construction industry as each personality from Employer, Contractor and Cost consultant. The place and time for the interview will be selected as prefer to the interviewee as easy to him / her. Same questions will be asked from each interviewee in same order. The researcher will be able to ask some limited questions only within a questionnaire survey. But the researcher will be able to ask some few more questions from the interviewee and also the interviewer is able ask some reasons additionally for each answer giving for each question when the interviewer needs furthermore clarifications. Interviews will give clear ideas / <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

opinions of the participant's and the interviewer will be able to ask and get further clearance from the interviewee about their answers, ideas or opinions. Mainly in this section aim is to obtain comprehensive ideas and opinions about effect and causes of variations in a construction industry from the following professionals' referred to their involvement in projects. Client Quantity Surveyor Consultant Quantity Surveyor Contractor Quantity Surveyor Project Manager Contractor The following subjects will be discussed referred to the topic of research with the Questionnaire surveyor; Present Role and responsibility, (Example: Contractor Quantity Surveyors' work involvement for identifying and preparation of variation submissions) Past experience referred to variations, (Example: Analysis, valuing, negotiation, use of standards condition of contract clauses) How variations are identified? (Example: Referred to issued instructions, contract documents and detail drawings comparing with the original scope of work.) What are the reasons identified by experience to transpire variations? How variations are effected with the project delays? What types of Condition of Contract are used for administrating the variations? What was the method you applied to minimize the variations? Questionnaire The researcher expects to do a quantitative survey by circulating a questionnaire among professionals who are involving in construction industry in Dubai. This questioner will be circulating by electronically among specially quantity surveyors working to clients & contractors, project managers, engineers, suppliers etc. Quantitative primary data will be collecting from this survey. The questionnaire will be comprising with 10 number of questions and 1st 4 questions will be discussing about the participant's personal details, position, experiences in industry etc and balance questions will be discussed about the particular subject such as <https://assignbuster.com/construction-industry-is-expanding-regularly-construction-essay/>

participant's experiences and his/her personal idea about "Necessity for minimize variation to avoid project delay in a construction industry. Few answers will be providing for each question and the participant has to choose one of them or more than one as required according to his / her experiences. This kind of arrangement of the questionnaire will make the process of analysis much simpler to the researcher to complete necessary graphs, charts etc. Approximately 45 no of responses expects by the researcher to get success from the questionnaire survey. Around 100 questionnaires will be circulating among above mentioned professionals to achieve the target. Analyze and Discusses All the data receiving from above different surveys will be analyze to find out the necessity for minimizing of variation to avoid project delays in a construction project. Conclusion /Recommendation In this stage is the final stage of the research methodology. The final stage in this research is to define the conclusion and recommendation with reference to the objective, subsequently to the analysis from the document study, interview and questionnaire survey. Chapter 03 Summary The Research design is a long process that demands careful attention. The research design initially started from the first chapter in bits and pieces explain in the design that goes right though this chapter in describing means and ways in the creation of the whole research. The entire research designs were comprehensively describes in the research design procedure. Document study and structured interview and questionnaire were elaborated in huge aspect. By this clarification, it is easier to understand the proceeding chapter.