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Faculty of Engineering

Construction Contracts in Amman City (Jordan) from Engineering and Legal Perspectives

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Committee Decision

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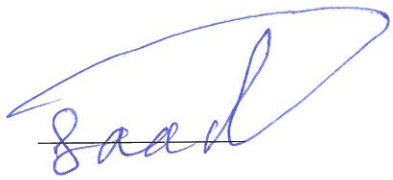
Prof Dr. Saad F. I. Alabdullah (Supervisor) Faculty of Engineering Isra University	
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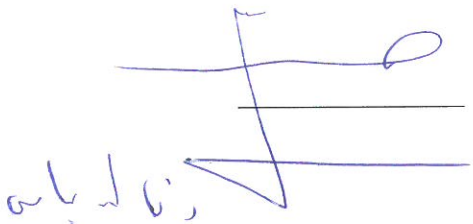
Prof . Dr. Ghaleb Abbasi Faculty of Engineering University of Jordan	

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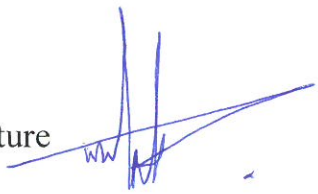
Signature 

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Abstract

Construcion Contract in Amman

From Engineering and legal

Perpectives

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Abstract

The study aimed to identify types of contracts presenting all aspects related engineering and legal fields . It also attempted to assess professional practices . the study sample consisted of (75) contracters selected from Amman . The study adopted the qualitative quantitative method , To achieve goals of the study , the researcher designed a questionnaire which was presented for judes for verification and amending Arithmetic mean and standard deviation and test hypothesis were used in the statistical processing of the data using SPSS. The result revealed that the best and clearest type of contracts was the government type with a Percentage (42.7%). Most companies prefer competitive contract with Percentage (40%) ; (50.7%) reflect The binding resbonsibilityTo local and muncipal laws. Wherever there was a conflict in contract dcuments, Priority should be given to FIDIC As seen in (46.7%) percentage . The engineer's order regarding anything Would never be executed without being Accompanied with a signed written Form and the value of z = 8.95 which is a moving factor .

Chapter 1

1.0 Introduction

The construction sector in Jordan is considered one of the important economic sectors, due to its contribution to the gross domestic product and employment. This sector is characterized by its extensive intertwining with all other economic sectors, and includes the main activities such as, Building construction, construction of roads and bridges, demolition and site preparation, electrical work, plumbing, heating and air conditioning, construction work related to other civil engineering projects, as the contribution of the construction sector to the GDP reached which nearly 8% (Department of Statistics, 2019).

The prosperity and development of modern business life, especially in the field of construction contracting, has led to the emergence of many transactions and conditions between the contracting parties, given the importance of this industry and the large number of employees and money that is paid to implement it. It is necessary for the owners of contracting companies and engineers to understand the laws that govern the contractual contract and the mechanism of its implementation . During life of the project, the contract is considered one of the most important means that control its progress . It is a binding agreement between the contracting parties. The formulation of engineering contracts differs from are another according to the type and nature of the engineering project. International bodies such as: The Institute of Civil Engineers in Britain And International Federation of Consulting Engineers. prepare legal contracts that define the obligations and rights of the parties to the contract (Matwiejczuk 2017,et.al ,)

The engineering contract has three main parties: the owner or employer, contractor (the project implementer) who provides the materials, labor, and mechanisms needed to build the project, and the engineer who acts on behalf of the business owner by following up the necessary work in planning and desin, (Dmaidi.et.al,2013). Contracts in the contracting industry are the controls from an engineering and legal point of view. The obligation to implement , from an engineering point of view , is within legal restrictions. "Contracting contracts" are service contracts according to which all parties to the contract bear the obligation to implement it.

FIDIC contracts are considered one of the most prominent contracts that regulate the relationship between the contracting parties, which are model contracts that contain rules, principles and foundations related to construction contracting works, and it is known as the red contract, given the features of construction contracts in terms of implementation at a specific time, and speed of completion of work (Assbeihat. Et.al,2016).

The contracting parties faced many obstacles in the contracting process, such as excesses of time and additional costs for construction projects, which resulted in disagreements between the parties to the contract, the tendency prevailed with parties of the contract to settle disputes that arise between them outside the regular courts by which the duration of the dispute is usually prolonged due to procedures and deadlines protracted (Assbeihat, J, 2005. Chong, H.Y. and Oon, C, 2016), That is why the parties to the contract resort to alternative means , instead of regular judiciary , to settle the disputes arising in the contract. The most important of these alternative means are: arbitration, mediation, and the use of experts, given its many benefits that take into account the special nature of contracting contracts, ensuring that disputes are resolved as quickly as possible between the parties of the contract and are kept strictly confidential.

According to recent studies, contracting parties often use a standard contract model to regulate the relationship and legal form, and to establish administrative procedures for a project implementation line (Chong, H.Y. and Oon, C, 2016), when the contracting parties fail to interpret and understand the terms of the contract, this will have a catastrophic effect on the project (Broome Hayes 1997 ;Styllis 2005, Love et al. 2011).

1.1 Research Questions

The research questions are as following below:

- Are there problems in the current construction contracts in Jordan?
- What are the most important problems found in construction contracts?
- How can be resolved these problems?
- Are construction contracts used by contractors suitable to be applied to different projects?

1.2 Objectives of the study

The current study of contracting contracts in engineering and legal terms in Amman aims to achieve the following:

- To identify types of contracting contracts used in Amman.
- To highlight aspect relevant to contracting contracts used in Jordanian companies from engineering legal perspectives .
- To examine and evaluate professional practices related to contracting contracts through the data collected .

1.3 Methodology of the Study

In this study, both quantitative and qualitative methods were used. The researcher also made use of the questionnaire and interviews via a set of questions that combine facts and opinions ,in addition to the theoretical part of the study .

The following chart presents the methodology adopted by the researcher throughout the study.

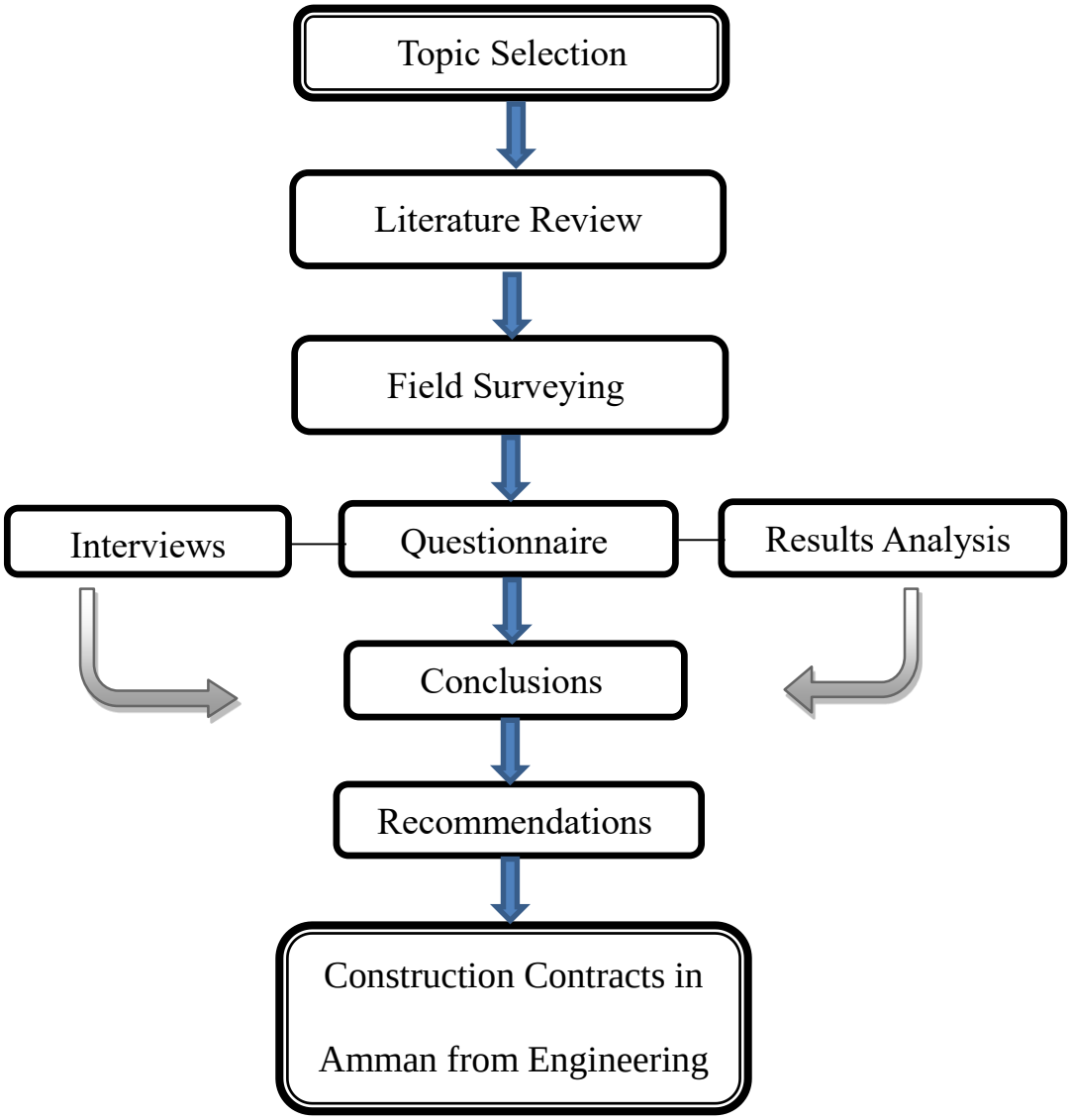

Figure 1.1: methodology research

1.4 The limitations of the study

1.4.1 Spatial limitation: This study was conducted on the contracting sector in Amman, including contracting companies, engineers, and engineering offices operating in the country

1.4.2 Time limitation: This study is limited to 2019.

1.5 Sources of Data collection

The study will collect data from the following sources:

1. **Primary sources:** a questionnaire were collected in order to come to answers that help in analyzing contracting contracts. The various contracts that contractors use will be selected, reviewed, and evaluated through a series of meetings and interviews with engineers, contractors, project managers in contracting companies.
2. **Secondary sources:** These rely on books, periodicals, magazines, articles, published and unpublished studies, in addition to Internet sites for studies, messages and research published electronically .

1.6 Thesis structure

The current research consists of five chapters as follows:

Chapter one: Introductory chapter which introduces the reader to objectives, significance, and question of the study .

Chapter Two: Review the relevant literature for major works , books , and articles concerned with the subject

Chapter three: it discussed the methodology adopted by the researcher to develop his thesis .

Chapter four: This chapter highlights data collection ,analysis and discussions the researcher did to come up to certain binding.

Chapter Five: This chapter present the finding and the recommendation the researcher proposed for further studies .

Chapter 2

Literature Review

2.0 Construction Industry

The construction industry crosses one of the fields of architecture and civilization throughout the world. Far from being a single activity, but complete construction processes involve many professions and industries. Which are usually managed by a project manager, and supervised by a construction manager, design engineer, construction engineer or project conterpart.

The construction industry is considered one of the most important economic sectors in the world,as it plays a major role in the community welfare. It is a service industry that provides products according to customers' request in addition to other sectors in that country.

a careful planning important To implement a successful project. It takes into account the environmental and legal implications, starting with drafting of the agreement in the contract between the parties. Schedules, budgets, tenders, security of industrial sites, availability of building materials, logistics, work within legal specifications, taking into account not to disturb the public, etc, (Ofori. G, 2015)

The final product in the construction industry is usually obtained through many contractual and procurement strategies for raw materials which differ from each other, and vary in their suitability for each type of project. The project gose through several different stages, where participants vary in each stage in accordance with their tasks and the role assigned to them. Their goals are often conflict with each other .

The industry building materials industry occupies a leading position in the economies of the countries of the region, represented by major projects and various economic components.

The global construction industry is expected to grow by an average of 3.6% a year over the forecast period 2018 to 2022, according to GlobalData, a leading data and analytics company.

The company's latest report, 'Global Construction Outlook to 2022: Q3 2018 Update' reveals that in real value terms*, global construction output is forecast to rise to US$12.9 trillion by 2022, up from US$10.8 trillion in 2017.

(https://blog.globalmarketanalyst.com/) .

This comes at a time when the real estate sector is the strongest link in cases of activity and recovery. It is the responsibility of the sector companies to deal with all the surrounding variables and improve their capabilities permanently to produce the best results besides to the severe negative effects that suffer Including real estate companies when competition intensifies, especially in cases of economic downturn and the decline of opportunities and limited projects.

The civil engineering sector witnessed a tremendous jump in the past years; thanks to the large urbanization around the world, which helped the sector to improve the lives of individuals through the provision of housing and transportation.

The construction industry is an important factor in global Gross National Product (GNP), although its importance has declined in recent years. However, it cannot be ignored as state-built facilities advance, total spending on rehabilitation and maintenance may increase , compared to the value of new construction (Hendrickson, 2010).

2.1 Types of Construction in Jordan

According to Instructions - Classification - Contractors.aspx

(Jordan Construction Contractors Association(JCCA) 2012) the types of construction in Jordan can be classified into the following five major categories with their own characteristics:

Article (5) A- Contracting works for classification of contractors shall be divided into the following areas:

1- Buildings
2. Roads
3. Electromechanical
4. Water and sanitation
5. Other works.

2.2 Contract Definition

The contract is defined as "an agreement governing the technical, financial and legal relationship between two or more parties to accomplish a work for a certain wage, provided that such work is not contrary to the law." Institute of Civil Engineers (UK) and the International Federation of Consulting Engineers".

2.3 The engineering contract parties

This consist of the following

owner or employer, engineer who works on behalf of the employer and instructs him to provide Technical and professional services required in planning, design of the project, and finally the contractor who will practically implement of the project, including provision of materials, labor and mechanisms to build the project.

The following figure illustrates that .

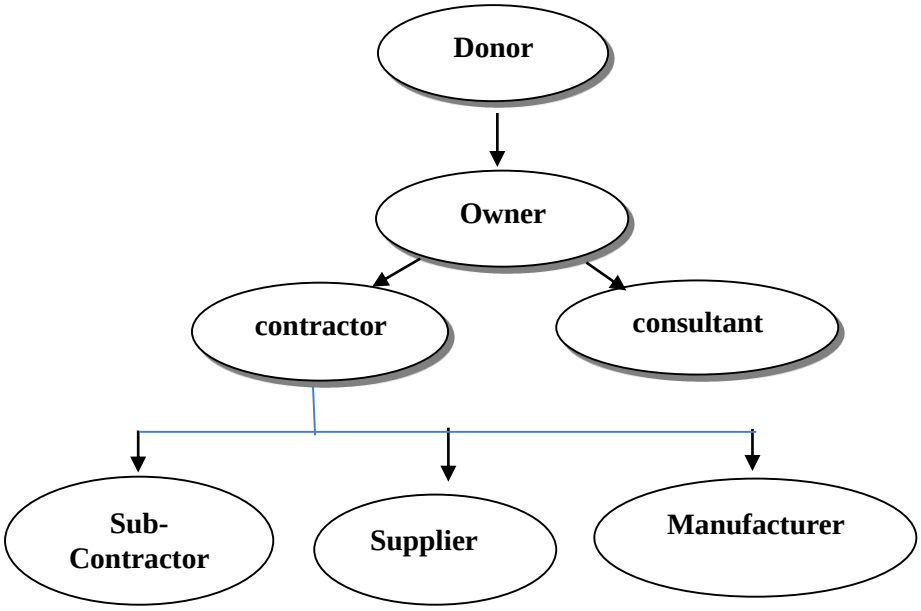

Figure (2.1) contractual relationships in any project

2.3.1 The main conditions of engineering contract

The engineering contract to be dependable , it needs to comply with local and international law, otherwise, it becomes meaningless, and cant be executed, or adopted as a judgment or evidence in judicial proceedings. To be legally acceptable, the contract should contain the following basic clauses: (Assaf , A .2017).

1. There should be an offer from one party (contractor) and acceptance of that offer by the other party (owner or employer).
2. There should be a realistic agreement reached between the parties through consent and acceptance.
3. The engineering contract must not be against laws.
4. The parties involved in signing the contract must be legally entitled to enter into such agreements, A contract is not legal if one of the parties is mentally retarded, or one who declared bankruptcy or seizure.

5. Formula Contract: The wording and language of contracts are of great importance and must be in accordance with law, especially in government contracts (The /government institution shall be a party in the contract) There is a need to ensure the proper disbursement of state funds, therefore, contract includes many conditions such as: Force Majeure, language of the contract, the application of law and regulations that explain the validity of the contract.

2.3.2 General details that should be included in the construction contract

1. **Objectives:** Offer acceptance and performance.
2. **Preparation:** Documents, design responsibility, agents, site representation, regulations, work risk, indemnities, insurances, securities, guarantees, etc.
3. **Execution:** Preparation, access to works, contracts instructions of variations, setting out works, assignment, nominated and selected subcontractors direct contractors etc.
4. **Completion Time:** Practical works and final completion, defects liability periods, sectional completion, revision of dates, penalties etc.
5. **Payment:** Interim payments to the contractor, adjustments, recoveries, final accounts etc.

6. **Cancellation:** By the owner or contractor and the rights related to default and disaster.
7. **Disputes:** Litigation, arbitration, adjudication, and mediation.

2.3.3 Types of Engineering Contract

Engineering contracts are prepared in different formats depending on the type of contracted work. These contracts vary in complexity from a simple agreement to a long, complex contract consisting of a large number of documents, detailing the contractual relationship in legal, financial and technical terms. The clearer and more precise the terms of the contract in determining the duties responsibilities and rights of the contracting parties are, the less likely there is a difference of opinion on the interpretation of those terms, and thus less likely to arise during the implementation process (Fisk & Reynolds, 2006).

Here are engineering construction contracts which can be divided into two main groups:

2.3.3.1 Competition contracts

Competition contracts are usually prepared on Fixed - Price Contract, Public sector contracts shall announce the intention of the government department or institution to build a project with a brief overview of it. Contractors wishing to enter the tender are required to fill out forms and submit documents supporting their technical and financial ability, inaddition to a Prequalification form and all records of previous work. The owner then selects a group of the most qualified applicants and invites them to purchase a copy of the tender book, specifications, drawings and other contract documents. They are required to study and submit their bids on a specific day including the letter of invitation, and must include financial insurance and other necessary legal documents with the tender. The owner then opens, analyzes and selects the best bid envelopes, most contracts also provide that the applicant is not obliged to accept the lowest tender or any other one.

In other words, the employer has the right to reject any tender without giving reasons (Laryea, S, 2017).

2.3.3.2 Competition contracts can be divided into two main types

A. **Lump Sum Contract:** Under this type of contract, the contractor undertakes to bear all the burdens of the execution of the project, including the value of materials, workers' wages, employee fees and other direct and indirect costs, for a lump sum paid by the owner (Fixed flat rate), Therefore, lump sum contracts are used in building construction, when the units of the project are standard in nature, many in number and different in types when using this type of contracts, there must be terms, specifications, drawings and terms of the contract shall also be clear and accurate and can not carry different interpretations (Rodríguez, J., 2016)

2.3.3.3 Unit Price Contract: The contractors who compete in this type of contract are required to set a quote for the quantities listed in the quantities table. They are also requested to calculate the total cost according to approximate quantities, The total value of the tender is the result of the actual measurement of the work performed. This type of contract has advantages such as: Flexibility to increase or decrease the volume of work, and is often used in contracts where the owner is a private enterprise. Public institutions rarely use this type of contract because there is more space that the owner cannot exceed in increasing or decreasing the volume of business. since there are similarities between these two types of contracts, there are also many differences in the tendering and execution of works, in the way of writing specifications, and in other contract documents (Darwish, M, 2017).

2.3.3.4 Negotiated Contracts (Cost - Plus Contracts)

Unlike competitive contracts, In this contract, the tender will be awarded after calling a specific number and a few highly qualified contractors from the perspective of the owner. In terms of previous experience and possession of the machinery, this type of contract is divided into the following categories:

A. **Cost Plus -a-Percentage -of- cost:** In these type of contract, the employer pays the contractor the real costs of the work plus the amount of his fees and profits. This amount is calculated in accordance with percentage of the total real cost of the work.

B. **Cost - Plus -a- Fixed - Fee:** In this type of contract, the owner pays the actual costs of construction plus a lump sum for the services, fees and profits of the contractor. This type requires precise specifications that clearly define the volume of work because the contractor will demand an increase in volume if it has substantially changed. This type of contract is frequently used in military and in private sector projects.

C. **Cost - Plus -a- Fixed - Fee & a- Percentage of Profit :** The contract gives the contractor, in addition to the amount for his services and fees, a percentage of profits in case of occurrence Savings in the total cost estimated at the time of signing the contract; in this way, the contractor has a strong incentive to save cost during implementation.

D. **Cost - Plus -an- Incentive Fee :** This formula is used in contracts where the time factor is of great importance. When the contract is awarded to the contractor, in addition to the full cost and the lump sum for his fees, another lump sum shall be paid for each day in which the owner can use the origin before the expected date of completion of the project when signing the contract, The contract may also provide for a delay fine if the contractor delays the completion of works on the specified date.

E. **Cost- Plus- a variable Fee:** The owner pays the entire construction cost to the contractor plus amounts calculated by a mathematical relationship based on the project cost and duration. A mathematical relationship is formulated by a method whereby contractor fees are increased, whenever the contractor saves from costs of the project and accelerates implementation so the project it is completed before the scheduled date.(Cushman, R.F; James J. Myers 1999).

F. **Guaranteed Maximum Price Contract:** Cost contracts, plus the contractor's fees, do not give the owner any means by which he can determine the total cost of the project .To overcome this, "the cost contract formula plus a lump sum with the contractor are needed to guarantee the maximum total cost of the project". so the contractor will no bear more amount for the entire increase. If the cost does not exceed the limit, then the full difference will be the share of the employer as the contractor has a share of that saving. In this case, the contract and its terms shall specify the agreed upon formula.

2.4 Other types of engineering contracts

There are other types of contracts of special form these which can be reached either by competition or negotiation, or by both. These contracts include:

2.4.1 Project management contract: According to this contract, the contractor shall be selected for, experience and strong opinion in the execution of similar projects. The contract may stipulate that the contractor who manages the project shall carry out part of the works directly, provided that the volume of such works shall not exceed 20% of the total project size. The contract shall clearly define the duties and responsibilities of the contractor. the "business manager", and his relationship to all contractors on site, in addition to the consultant. More ever, the contract may be comprehensive in design, supervision and project management (Suprapto et al., 2015)

2.4.2 Turnkey contract: Under this contract, the contractor will complete all works, including the supply of materials, and possibly design and implementation together for a specified amount . so that the project is fully delivered to be used directly , whether that was residential building, hospital or factory, (Merna, A., Smith, N, 2012)

2.4.3 Union or joint venture contracts: Union contracts are used when the volume of the project is very large . In this case, the responsibility for the execution of the contract by one company will be a heavy burden on the company in terms of financial, administrative and technical aspects. In addition, if this project has any problems, it may mean that the end of the company. For these and other reasons, the idea of union contracts was formed. In this type of contract, two or more companies are united to create an entity that resembles an independent company or institution. The efforts of the constituent companies are

necessary to provide financial, administrative and technical capabilities for the implementation of the project, The Federation of Companies differs from other companies and institutions in that it is established for the implementation of a single project, therefore , it does not have the status of continuity.Its survival is linked to the implementation of the project for which it was established. In this case, there must be an agreement signed by the constituent companies of the union. to clarify the method of financing and management of the project, in addition to the way in which the members of the union bear the risk, besides division of profits or losses, and must be approved by the owner (employer) of the agreement . It is usually one of the partners who formed the Federation as its President, and this partner has the highest percentage of the Union's capital and responsibilities (R.J. Clews, 2016).

2.5 FIDIC contracts: importance and types

FIDIC contracts are considered to be a relatively recent once. which were approved by the International Federation of Consulting Engineers (IFCE) It even derives its name from the abbreviation of the initials of this union. As these contracts regulate the rights and obligations of the contracting parties and the equitable distribution of risks, known as change orders for construction work, especially that construction projects that are very volatile and are exposed to many risks and difficulties such as force majeure or unexpected financial difficulties. Sometimes, construction work is not completed in the correct and satisfactory way except by resorting to these change orders. Despite this, FIDIC contracts lack a unified legislative organization in the Arab countries (FIDIC, 2018).

2.5.1 FIDIC contract concept

FIDIC contracts are model contracts established by the(IFCE),which include general and specific conditions for different types of building and construction contracts in order to achieve a balance between the rights and obligations of their parties, define their legal positions with a view of construction work organizing and unifying the applicable legal rules. they and can be widely used for different types of projects , international and

domestic engineering, which are used throughout the world. These have been modified and developed more than once in line with developments in laws of different countries, consulting engineers, and some international organizations , such as the World Bank and the Bar Association Mechanism to ensure compatibility with the rules of most of the legal systems of European countries and the majority of world countries .

2.5.2 The importance of FIDIC contracts

FIDIC contracts are important and can be briefly referred to as:

1) Established a prior contractual framework to overcome the problems of international and local construction where these contracts aim to mitigate the risks to which employers, contractors, and engineers are exposed during the implementation of projects.

2) It has achieved the principle of self-sufficiency in building and construction contracts. It is characterized by good preparation and equitable distribution of risks and detailed integrated construction contracts, it also contains detailed provisions , specified obligations and rights of parties and how to implement the contract and avoid wasting time in solving problems that may arise. It aims to facilitate the task of the parties which provide legal security for contractors and employers, as the provisions of these contracts are sufficiently clear.

3) They were approved by the World Bank, international lenders, and International Chambers of Commerce. In fact, some of these lending institutions are need for required to rely on the FIDIC contract to rely on to accept the loan application.

4) A clear road map is drawn for the relationship between the employer, the contractor and the supervisory body, wich defines the legal and contractual centers for each party .

2.5.3 Types of FIDIC contracts

The (IFCE) has issued several types of model contracts in the field of building and construction, where each contract was distinguished for the color of the envelope in which it was issued. in order to facilitate the distinction from other models. The presence of the various forms of FIDIC contracts provides an opportunity for the contracting parties to choose the best and appropriate form of contract according to the type of business and services needed for the project.

Each model of FIDIC contracts includes a set of appropriate general conditions that regulate the rights and obligations of its parties in an efficient and effective way for the construction project whose application is required to be specifically approved by the parties of the contract, in addition to special conditions specifically formulated to suit every individual contract.

It is prepared by negotiation between the parties and aims to amend or delete some general conditions, taking into account the comments contained in the FIDIC Contract Directory, and consequently a presentation of the most important types of these contracts:

A) The Red Book

This contract model is the most used in practice and includes the contractual terms form for civil engineering works contracting designed by the employer, his representative , or his engineer. In this type of contract, the contractor performs construction work according to the details of the designs submitted by the employer. The engineer's role in here is to supervise and prepare reports. However, the contractor may be asked to design a portion of civil, mechanical, electrical or construction works, but if he is required to design most of the works, it is appropriate to use the contractual terms mentioned in the yellow book.

B) The Yellow Book

This contract model includes the terms of a for mechanical and electrical engineering works contracting designed by the contractor in which he undertakes the supply process and executes it according to the requirements of business owner. (IFCE)has published (the Golden Book) which is an extension of the yellow one, as it includes the conditions of designing, building and operating projects and some of the rules contained in other books.

C) The Silver Book

This contract model includes the terms of the integrated project contract which includes engineering, purchasing, construction, and turnkey delivery, also called (turnkey) contracts, so as to enable the contractor to prepare the design, supply, and construction in

accordance with the exact description provided by the business owner about the project and its purpose.The contractor will also take the tests upon completion from engineering project to be fully equipped for work.

The contractor also guarantees, under this contract, the safety of the project from any risks in the design and implementation process.

In addition, this contract aims to limit the introduction of a price adjustment or implementation period, but there was no clear role for the engineer. This constitutes an evolution of the aforementioned contracts combined and appropriate projects for the construction of power plants, petroleum installations, water treatment facilities, telecommunication networks , and ports marine and airports.

D) The Green Book

This contract is considered a model for construction contracts or engineering works with a relatively small or short-term financial value. and It is called (summary contract), whereby the contractor performs construction or mechanical and electrical works in accordance with the design that is carried out with the knowledge of the employer or his representative or jointly between the contractor and the employer.

2.6 Engineering contracting documents

The documentation of any engineering contract varies in quantity and quality from one project to another depending on several factors. Competition contracts differ from the negotiation ones, in terms of type and size of the documents that make up the contract in each of them. The contract documents vary according to the size of the project, when the size of project is small, the relationship between the owner and the contractor is easier and vice versa. The documents are usually in the form of an agreement and some general conditions including drawings, specifications, quantities bonds, insurance, contractor's presentation and all information sufficient to show the nature of the contract. These documents are used by engineers, contractors and owners to convey technical and legal messages and ideas to various parties . Therefore, the main purpose of the construction contract documents is to accurately define the relationship between the two parties or the contracting parties,

and to define the rights and obligations of all parties under this contract (Zhang,et.al, 2018).

In general, the following documents are required:

1. **Invitation letter:** It is a letter from the employer in which he describes the work to be created ,briefly and invites the contractor to bid for the project**.**
2. **Instructions to Contractors:** They are detailed instructions given to contractors to enable them to bid properly.
3. **Tender or Bidding Form:**" This document specifies the willingness of the contractor to enter the project at a certain price and at a specified time. " it must be signed by the contractor and stamped with his official seal**.**
4. **Agreements**: This is a legal document (sometimes called a contract form) that binds both the owner and the contractor to certain obligations. Typically, type of obligation, value of the contract, time of its execution, in addition to a number of other important items are determined, in this agreement.

2.7 Contract Conditions

The special conditions (sometimes called the original contract) according to (Michael E. Purdy, 2010) include:

1. Names of the parties and date of their contract

2- Place of the contract

3. Nominal amount of the contract: the amount determined, based on the quantities estimated in the table of quantities to the agenda already implemented.

4 - Duration of work

5 - Penalty for delay

6 - Insurance

7 - Payment method

8. Arrests (percentage deducted from extracts)

9 - Receiving (including temporary and final)

10. Contract system

2.7.1 General conditions include

1. General obligations of the contractor toward other
2. Guarantees given
3 - Workers and agents of the contractor and management involved
4. Implementation of the work agreed upon
5 - Delays and deficiencies in carrying out commitments
6. Waiver of contract in case of certain events happen .
7 - Resolve differences between disputant
8. Miscellaneous provisions.

2.7.2 Supplementary general conditions

These often describe some formulas whereby an application is submitted or a notice sent from one party to another, besides the form of acceptance or rejection.

2.8 Feasibility Study

The feasibility study has three basic elements:

1. Technical feasibility: It is studying the possibility of establishing the project from a technical point of view, based on the conditions of the site, climate, soil condition... etc.
2. Financial Feasibility: The financial resources and raw materials that must be available for the project.
3. Economic feasibility: study the costs and benefits resulting from the project.

2.8.1 Preliminary Design

At this stage the architect will initially plan the proposed site, make the required divisions and then discuss it with the owne .he will also provide a preliminary study of building materials, estimation of the required quantities of these materials, and estimation of the initial cost of the project.

2.8.2 Detailed design

After the initial agreement on the initial drawings, the architectural designs of the project are made (interior details, facades and facilities). structural, mechanical and electrical details are also designed for all parts of the project .This way, an integrated idea of the components of the project and the proposed means of implementation can be developed.

2.9 Reasons for termination of engineering contracts

The parties involved in any contract may terminate it at any time during the term of the contract. if they agree on that There are also other cases for which the contract is automatically terminated or nullfied, such as: besides death of the contractor, doesn't declaration of bankruptcy of one of the parties, besides when each party doesn't fulfill its obligations for the contract. (Murdoch, J. & Hughes, W, 2010)

2.10 Expiry of the contract

2.10.1 Expiry of the contract upon completion of works

A contract shall normally be terminated automatically at the moment when each of the parties of contract fulfills its obligations in full, upon ensuring the accuracy of the execution of the contract, its conditions, specifications and the contractor fulfills his full entitlements in return for his actions.

2.10.2 Termination of the contract by agreement

The parties of an engineering contract may agree to terminate it at any time when valid. The termination agreement may be based on mutual waiver, i.e., the parties to the contract give up their rights and obligations under the contract in a mutually agreed upon manner. Often the termination of the convention is based on the principle of compensation, that is, the contractor is obliged to make payments to the assigned party in return for not being required to fulfill its obligations under the original contract (Al-Jamal, 2012). The

termination agreement may also be based on “agreement and consent”, with either compensation or exemption from obligations free of charge. Engineering contracts usually contain a special clause that allows the owner to terminate the contract at any time at his request of, in either , the parties concerned agree to settle the financial issues willingly .

2.10.3 Termination of the contract by denunciation

When a party to a contract refuses or fails to fulfill its obligations under the contract, or when the actions of one party make the contract impossible, The other party has the right to terminate the contract on the basis of cassation. In this case , the failed or defaulted party is obliged to compensate to the other party or parties for the damages they suffered from . Financial matters may be liquidated after termination of the contract through cassation either by direct agreement between the parties concerned or by arbitration (Michael E. Purdy, 2010).

2.10.4 Termination of the contract for the impossibility of execution

A contract can be terminated due to the impossibility of implementation, when it was found that after signing the contract , it was found that one of the parties did not exist before the signature that makes impossible . Examples on that are soil condition at the project site does not bear the construction of the dam: (Jordanian Civil Code, 2019).

* When implementation becomes impossible; due to local laws and regulations (for example, preventing the transfer from the Central Bank of foreign companies).
* When the type of contract disappears prior to execution, like when the ship sink prior to signing of its purchase contract.
* Because of illness or death of one part of the contract
* When the means to be used for the execution of the contract are destroyed.

2.10.5 Termination of the contract by force majeure

Force majeure is an unusual force such as war (declared or undeclared), a revolution, or a change in regime that makes it impossible to continue to perform the contract, The contract

must contain a clear definition of force majeure, given the critical importance of such a definition, and the legal and financial implications of the future. These definitions and concepts differ from one contract to another and from country to another. The definition of force majeure adopted by a body or organization specialized in the preparation of model contracts also varies according to laws of the State, or the countries in which those bodies or organizations are present (FIDIC, 2018). For example, the definition of force majeure contained in the FIDIC model of engineering contracts in Europe differs from that of the American Institute of Architects (Tadros, 2014).

2.11 Jordanian Engineers Law

Engineers, Association Law, Article (1): This Law is known as (The Engineers Association Law for 1972) and will be effective as of the date of its publication in the Official paper.

DEFINITIONS:

Article (2) state that engineering science provided for in this Law or branching from one of the main engineering disciplines stipulates that practice of the Profession in any engineering work in the areas of engineering should include : a provision of engineering advice, conduct of studies and research, development of engineering designs, drawings or specification,with the intention of implementing of these drawings or supervise those who are entrusted with the implementation, maintenance or operation thereof requires an engineering staff to carry it out via an engineering office or through a consultation or Specialization office (Engineers Association Law NO (15), 1972).

The engineer must use logical methods to solve any problem of confrontation where he formulates the final equations to objectively guess the conformity of the results with reality. There should exist a necessary expertise and precision measurement because these are the most important in the process of legal thinking. The engineer should follow the law as the basic guide in the process of drafting contracts or resolving disputes, even through rules exist. He must consider the economic and political pressures of being part of the process as a whole, and pay attention to all parties of contract owners, contractors, opponents and lawyers (Frank B. Watts, 2012).

2.11.1 Legal Practices

Law regulates the general legal principles: from drafting construction liability, public safety violations, labor law and issues, time and delay extensions of Project implementation, subcontracting, causes of lawsuits, liability arising from contract or negligence; monitoring the proper functioning of the supervising engineer; important points of dispute resolution, arbitration ,false claim and litigation, laws and regulations of fire and insurance issues (Chong, H.Y. Oon, C, 2016)

2.11.2 Contracting contracts in Jordanian civil law

The contractoris defined as : any natural or legal person practicing the profession of construction contracting, licensed and registered in accordance with the provisions of law, presented in the Jordanian Construction Contractors Association (JCA, 2014).

According to Jordanian civil code article (780) the contract is an agreement under which one party undertakes to make something or performs work in exchange for a pledge by the other party.

Article (781) - The agreement may be limited to the contractor undertaking to provide the work on condition that the owner of the material used in carrying out his work shall be provided by the contractor.

Article (782) - The contract shall describe its place, type, capacity, manner of performance, duration of completion and corresponding allowance.

2.12 Obligations of the Contractor

The following articles illustrate such obligation

Article (785) The Contractor shall complete the work in accordance with the terms of the contract; If the contractor is found to be doing what he has promised in a defective or incompatible manner, the employer may request the immediate termination of the contract if the repair of the work is not possible, but if it is possible, the employer may require the contractor to comply with the terms of the contract and correct the work within a reasonable time. If time elapses without rectification, the employer may request the court to terminate the contract or authorize him to assign the work to another contractor to complete the work at the expense of the first contractor.

Article (786) the contractor undertakes any damage or loss other than modification or default thereof unless proven otherwise or not verified.

Article (788- 1) If the contract is based on the fact that the construction works shall be shared between the designing engineer and the contractor, then they shall be jointly liable to compensate the employer for what happens to the project within ten years of works that are totally or partially destroyed in buildings or erected by establishments.

Article (790) any condition intended to relieve or limit the contractor or engineer from warranty shall be void.

Article (791) the guarantee claim shall not be effective after one year from the date of the demolition or discovery of defects.

The law regulates construction contracting contracts in most cases, but contracting companies differ from other companies by noting that there are many lawsuits, and therefore the need for more laws to protect parties to the contract and their rights. These laws according to (fisk & Reynolds , 2006) are classified into four main categories as follow:

1. Law of Contracts: These are the laws and instructions that have a direct impact on the conclusion of public and private contracts.

2. Laws governing the proper implementation of the work of the project, which has to be implemented under the contract between the parties to the contract.
3. Laws related to items of differences and disputes that may occur during the execution of the contract.
4. Licensing and occupational laws governing business practices and standards of technical and personal qualifications of various persons involved in the construction process (Engineers Syndicate Act, 1972)

Legal regulations for determining of construction contracts of importance are currently implemented according to the FIDIC procedures for implementation management, like the model of construction organization developed by FIDIC engineers for public.

Mentioned Lawrence Bennett (2007), mentioned that Engineers can participate in law related to construction contracts in cases that follow:

1. Preparing some contract documents and specifications

2. Contracts relationships and financial claims and payments

3. Clarifying the terms of contract and settle disputes.

4. Educating lawyers engineering matters.

5. Dispute resolution without courts.

6. Engineer Participation as witness and mediator in disputes.

2.11.3 Disputes in construction contracts

The deterioration of the traditional contracting method has led to the emergence of hostility and complaints. Conflicts may arise over the quality of work, delay in implementation, or payments, due to certain conditions or reasons. The dispute may be resolved in the contract from the beginning, or may be presented during implementation, or by litigation (Enshassi, A., Abu Rass, A., 2008)

The reason behind is the large number of complex events in construction technology and the multiplicity of overlapping operations of the project. For this reason, employers, contractors, and relevant parties in the construction industry seek to manage project budgets and cash flows, follow up schedules, financial claims, and other factors that may cause conflicts.

That is why the construction industry is one of the most exposed to conflict and disputes that make it the largest sector in which parties resort to litigation. to resolve disputes.It is often costly and of a long-term, as there are alternative methods of conflict resolution (ADR) in the construction industry as a way to avoid long litigation and higher costs (Derrick, G., 2016).

Available methods for resolving disputes include mediation, adjudication, arbitration, expert judgment, and finally court litigation procedures. Contractors and employers should consider the method that is best used to settle disputes according to the type and form of the contract at the lowest costs (Derrick, G., 2016)

2.13 Dispute resolution methods

2.13.1 Mediation method

it is used to resolve disputes within the construction industry. The Construction Court Handbook provides guidance on encouraging parties to use alternative dispute settlement (ADR); the protocol requires construction and engineering disputes to meet at least once before commencing litigation to discuss whether a mediation method would be a more appropriate way to resolve a dispute.

2.13.2 Advantages of the mediation method

- The mediator is considered an independent person, will not make a decision or judge, but will assist discussions between the parties with the aim of resolving the dispute Mediators are usually highly experienced in the conflict field.
- Mediation helps parties to establish a good relationship.

- It is one of the fastest ways which may only take several days to resolve the dispute, in addition to being less costly in of the litigation process.
- Confidentiality mediation.

2.13.3 Disadvantages of Mediation: In some cases, the side of actions of one of the parties may be revealed, despite the confidential nature of mediation. It may benefit one of the parties in dispute if he intends to bring the case to court.

2.14 Adjudication method

The judgment process is carried out by a neutral third party who makes a decision and resolves the dispute. Disputes are resolved by facts and documents and law principles. As the Construction and Building Law of 1996 (the Construction Law) the parties to the construction contract may refer their disputes to an adjudicator (Derrick, G., 2016).

2.14.1 Benefits of Adjudication: An arbitrator is a neutral person with experience in this regard. Adjudication is a speedy and flexible process if Compared to court procedures.The arbitrator ensures that cash flow is maintained during the construction process, judgment is less expensive than court procedures, and the arbitral tribunal's decision resolves the dispute in many cases.

2.14.2 Disadvantages of adjudication: The dispute shall be submitted to the parties before commencing the arbitration process, The capabilities of the arbitrator are within the court's procedures and are required to enforce the arbitrator's decision if the "losing" party does not pay. One of the parties is responsible for the costs of the arbitrator and arbitration venue.

2.15 Expert estimates method

It is used by of experts to resolve disputes of a specialized nature in the contracting industry, It is one of the informal ways to resolve disputes. The expert report is often used in the event of assessment disputes. When an expert is appointed to resolve the dispute,

the two parties must, according to a contract between them, agree to the expert's determination that will be binding.

3.15.1 Advantages of Expert estimates: It is a cost-effective way to resolve disputes, and is a faster and an informal method for doing that.

2.15.2 Disadvantages of Expert estimates: It is difficult to challenge the expert's decision, as the method is less related to legal processes. In the end, the expert's report cannot be enforced without a judicial process.

2.16 Litigation method

Although there are many ways to resolve alternative disputes, one party may have to request a court to resolve disputes. The court is governed not only by the Civil Rules law, but also by the Construction Court Guide and there is a judge who is specialized in resolving Conflicts. (Derrick, G., 2016).

2.16.1 Benefits of Litigation

- The judge is responsible for managing the claim process throughout the case.
- The court is able to solve complex cases.
- The court's decision is mandatory and applicable to all parties.

2.16.2 Disadvantages of Litigation

- The litigation process is slow.
- It is more expensive than others
- Litigation procedures are public and not confidential, except in special circumstances (Hendrickson, 2008).

Chapter 3

Methodology

3.0 Introduction

In this chapter, the methodology and statistical methods will be discussed to illustrate the purposes of this study. This will be done through reviewing relevant literature , analyzing construction contracts and finally conducting a questionnaire to answer questions raised (Szydlik, C, O. 2014).

This chapter includes information on the methods used to test the study hypotheses and to analyze them in order to achieve its goals . In addition the chapter includes research strategy, design, population, sample, spatial limits, method of selecting the sample and its size, questionnaire design, data measurement, and finally questionnaire validity.

The methods have two parts: the first is the techniques available for data collection and analysis, and the second is the techniques that have already been used in the current research project whose answer help in achieving the study aims.

3.1 Research Design

The research design consists of the outline of elements that have a relationship with the variables of the study. The design also explains how the study population, samples, measurement methods and data collection plan are chosen for the purposes of achieving the study goals (Taha, 2016).

The researcher used the questionnaire method as a quantitative and qualitative research method based on literature related to construction contracts, which is one of the methods of data collection.

3.2 Research Population

The targeted community in the current research consists of all contractors registered in the Jordanian Contractors Association (JCA) and those working in the field of contracting, buildings, roads, water, sanitation, mechanics, electricity, public works, and all that is related . According to the (JCA) website, the total number of contractors registered under the six categories is 2163 throughout governorates of the Kingdom till end of 2018.

The current study targeted contracting companies and contractors working in the capital Amman which namounted to 219 contracting companies.

This city was chosen because it is the economic capital of the Kingdom, and about 60% of available construction companies are headquarter in Amman .

3.3 The Chosen Research Strategy

The search strategy is the method by which interrogations can be used to achieve the research objectives. There are two methods of research strategies; the first is quantitative research, and the second is qualitative one. The method of research that should be implemented primarily depends on the purpose of the study and the type of information required (Naoum, 2007).

In the current study, the researcher adopted both the quantitative and qualitative methods, a survey, due to its simplicity in construction and ease of understanding .The method of distribution via e-mail and benefitting from Google forms, was instead of hand delivery.

3.3.1Quantitative research

It is a systematic phenomenon of the research to collect quantifiable data and to use statistical or mathematical methods. Quantitative research relies on the mechanism of collecting information from existing and potential clients by using sampling and questionnaire online surveys, etc., whose results can be outlined in numbers (Easterby-Smith, et,2012).

3.3.2 Qualitative Research

It is a research that usually collects and analyzes personal data. in a descri8/ptive manner, signs, letters, experiences, etc., instead of resorting to numerical inputs. The topic is explored without prior formulas, therefore the goal is to gain understanding and gather information and data that will present theories, When comparing quantitative and qualitative research methods, the former answers questions that begin with: Why? How? In what way? While the latter answers questions related to how many? How much? How often? To what extent?

3.4 Method of sample selection

The term sample means a specimen or part of a whole population which is drawn to show what the rest is like , (Naoum, 2007). and the sample is part of the entire population study which involves selecting a group of people, events, behaviors, or other elements for a study.

The selection of the sample is very important; the researcher must be very careful when in selection to ensure that the sample meet the purpose of the study .

3.5 Sample Size

According (Scheaffer, Mulekar, & McClave, 2010) the following Stephen Thompson`s equation is used to determine the number of the individuals constituting the representative sample:

$$n = \frac{\mathbf{N} \times \boldsymbol{P}(\mathbf{1} - \mathbf{P})}{(\mathbf{N} - \mathbf{1}) \times (\mathbf{e2} \div \mathbf{Z2}) + \mathbf{P}(\mathbf{1} - \mathbf{P})}$$

$$n = \frac{\mathbf{219} \times (\mathbf{0.5})(\mathbf{0.5})}{(\mathbf{219} - \mathbf{1}) \times (\mathbf{0.01} \div \mathbf{3.8416}) + \mathbf{0.5}(\mathbf{1} - \mathbf{0.5})}$$

$$n = \frac{\mathbf{219} \times (\mathbf{0.5})(\mathbf{0.5})}{(\mathbf{219} - \mathbf{1}) \times (\mathbf{0.01} \div \mathbf{3.8416}) + \mathbf{0.5}(\mathbf{1} - \mathbf{0.5})}$$

n = 67

Where:

N : population size

Z: standard score 1.96

e:error percentage 0.1

The sample size consists of (75) contractors, out of the total population (219) who were chosen from Amman according to type of contracting company. The sample represented (35%) of the total population, and the questionnaire was distributed to the study sample of (100) contractors who were chosen as a stratified random one, The number of retrieved questionnaires was (90), (15) of were discarded an invalid and were dropped, and (75) questionnaires were approved, and that constitutes (75%), of the total number .

3.6 Questionnaire Design

The researcher used the method of closed questions in the questionnaire. such questions need a short response with yes or no, agree or disagree, important or not, etc. It is easy to ask closed questions and answer them quickly, they do not require writing by the respondent, and their analysis is clear and direct.

The questionnaire covered ten pages beginning with a cover letter explaining purpose of the study, importance of the information provided and confidentiality of the information provided, in of the questionnaire.

The questionnaire was divided into three sections as follows:

1. Information about the contracting company
2. Information about contractual practices
3. Types and specifications regarding construction contracts used in Jordan

The questions consisted of the first two sections in multiple choice formats, and the other two were agreement scale questions.

3.7 Measuring data

Likert scale was used in the current study to measure respondent's , answers. The scale is the mostly used one a measurement technique, it is a method for measuring behaviors and preferences used in psychological tests devised by the psychologist (Renaissance Likert). It is used in questionnaires, especially in the field of statistics. The scale is deal with responses indicating the degree of approval or objection of a certain formula.

It expresses the sum of the responses obtained about "Likert paragraphs", which are a statements that the respondent is asked to respond to by choosing an answer. As for "Likert item", it consists of two parts: a stem, which is a sentence that defines a behavior, and a "ladder" which is a scale used to determine the degree of approval and variation with the phrase stem.

3.8 Verifying validity of the study tool

The validity of the study tool was verified through external and internal uniformity, as follows:

3.8.1 Face Validity

For the purposes of verifying , validity the study tool was presented to a number of academic arbitrators who are experts in the field of contracting contracts. to give their opinion on its item in terms of their linguistic formulation, the extent to which the they belong to their fields, their suitability for the purpose for which they were designed .They were modified according to the directions of the arbitrators where some changes included deletion, language correction , scientific formulation, and anded up in the analyzed.

3.8.2 Construct Validity

Reliability means the extent to which the items of each of the study variables suits the variable to which it belongs. Attention focused on making sure that each of the study variables is accurately represented with a set of paragraphs or phrases appropriately and that these paragraphs actually measure this variable, where the researcher applied a test Correlation, and the validity of the content of the study tool was measured by measuring the relationship between each paragraph and the axis to which it belongs and excluding the paragraphs whose correlation coefficient is weak depending on the correlation relationships that exceed (95%) and its statistical significance is important at the level ($\alpha \leq 0.05$), as follows:

First- items (professional practices in contracting contracts used in Jordan)

Table (3.1) Certification of construction clauses (professional practices in contracting contracts used in Jordan) / (n = 75)

Item	Correlation coefficient	Significance level
1	0.77	**0.00
2	0.82	**0.00
3	0.69	**0.00
4	0.74	**0.00

Item	Correlation coefficient	Significance level
5	0.71	**0.00
6	0.88	**0.00
7	0.82	**0.00
8	0.78	**0.00
9	0.69	**0.00
10	0.87	**0.00
11	0.53	**0.00
12	0.44	*0.021
13	0.37	*0.030
14	0.38	*0.029
15	0.45	**0.00
16	0.31	*0.028

Item	Correlation coefficient	Significance level
17	0.28	*0.029
18	0.64	*0.00
19	0.92	**0.00
20	0.88	**0.00
21	0.54	**0.00
22	0.68	**0.00
23	0.77	**0.00
24	0.75	**0.00

*** Statistically significant at the level (0.05).**

**** statistically significant at the level (0.01).**

From the previous table, it is clear that the correlation coefficients of item of the scale (professional practices in contracting contracts used in Jordan) with the total score of the scale ranged between (0.28) and (0.92), which is statistically significant at the level (0.01)

and the level (0.05). This indicates that there is a strong internal consistency of items of the scale .

Secondly- items (specifications of engineering contracts in Jordan)

Table (3.2) Construction Certification for Scale Clauses (Specifications of Engineering Contracts in Jordan) / (N = 75)

Items	Correlation coefficient	Significance level
25	0.33	*0.02
26	0.57	**0.00
27	0.77	**0.00
28	0.85	**0.00
29	0.47	**0.00
30	0.36	**0.01
31	0.72	**0.00

32	0.82	**0.00
33	0.77	**0.00
34	0.65	**0.00
35	0.66	**0.00
36	0.32	*0.03
37	0.62	**0.00
38	0.66	**0.00
39	0.68	**0.00
40	0.72	**0.00
41	0.59	**0.00

The previous table shows that the correlation coefficients for items scale paragraphs (specifications of engineering contracts in Jordan) ranged between (0.33) and (0.85), which is statistically significant at the level (0.01) and the level (0.05) ; this indicates a strong internal consistency of item of the scale.

3.9 Data Analysis

The data collected in Excel was used by unpacking it on the statistical packages program (SPSS) in this research to analyzed data .

The following statistical methods were adopted: (1-Percentages, 2- mean, 3- standard deviation 4- Hypothesis test).

3.10 limitations of the Study

Restrictions in the current study were limited to contractors who had a valid registration with the Jordanian Contractors Association until 2018; and contractors without valid registration were not included. The study was also limited to contractors in the capital, Amman, and excluded the rest of contractors in the kingdom.

3.11 Study impediments

The researcher's interface has many limitations and obstacles while conducting the steps to distribute and receive the questionnaire which can be outlined in:

contractor's lack of interest in presenting his views regarding the current research topic, the lack of cooperation by some of them who delegated answering the question to company engineers, despite the researcher's indication that it is for the purposes of scientific research.

Contractors were given at least two weeks to take their time to understand the questions and answer them, after which some were not answered on the pretext that they did not have enough time, while other contractors lost the transcript of the questionnaire, few responded quickly , but others were not interested.

The researcher sent the questionnaire again and again, taking to them several times on phone and visited them more than once. Each time they raised a new argument, but finally the researcher could collect an appropriate number of responses.

Chapter (4)

Data Analysis

In this chapter, the study data obtained from sample were analyzed and their questions answered.

4-1 Description of the study sample

The sample size consists of (75) contractors, out of the total population (219) who were chosen from the entire population according to type of contracting company. The sample represented (35%) of the total population, and the questionnaire was distributed to the study sample of (100) contractors who were chosen as a stratified random one, The number of retrieved questionnaires was (90), (15) of were discarded an invalid and were dropped, and (75) questionnaires were approved, and that constitutes (75%), of the total number .

4.1.1Company Classification

Table (4.1) Distribution of sample individuals according to the classification of the companies

Company Classification	**Frequency**	**Percentage**
First class	40	%53.3
Second class	12	%16.0
Third class	10	%13.3
Fourth class	7	%9.3
Fifth class	6	%8.1
Total	**75**	%100.0

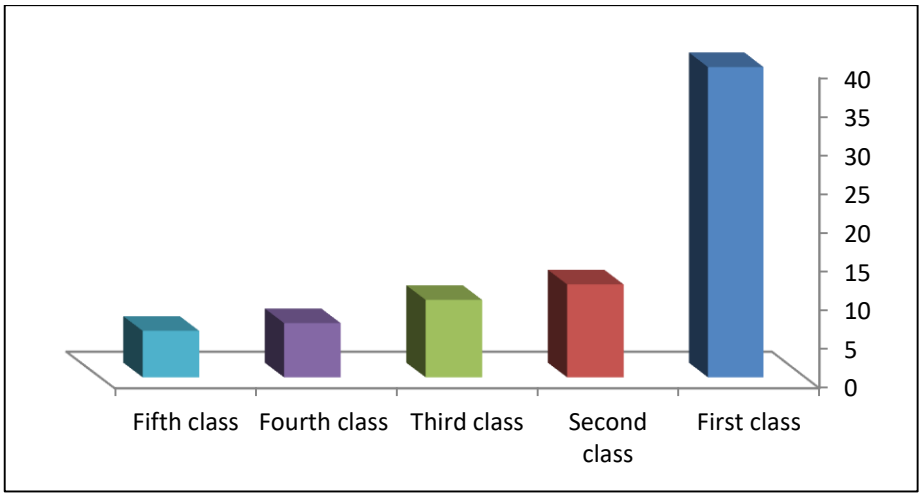

Figure (4.1): classification of the companies

The the previous table, shows that most of the study sample engineers work in contracting first class companies as they numbered 40 engineers with 53.3% ;16.0% work in second class contracting companies and 13.3% in third- class companies, 9.3% in fourth class and 8.0% in fifth class.

4.2 Project Type

Table (4.2) Distribution of sample individuals according to the type of projects the company is working on

Project Type	**Frequency**	**Percentage**
Building	33	%44.0
Roads and bridges	15	%20.0
General works	11	%14.7
Water and sewage	7	%9.3
Electromechanic	9	%12.0
Total	**75**	%100.0

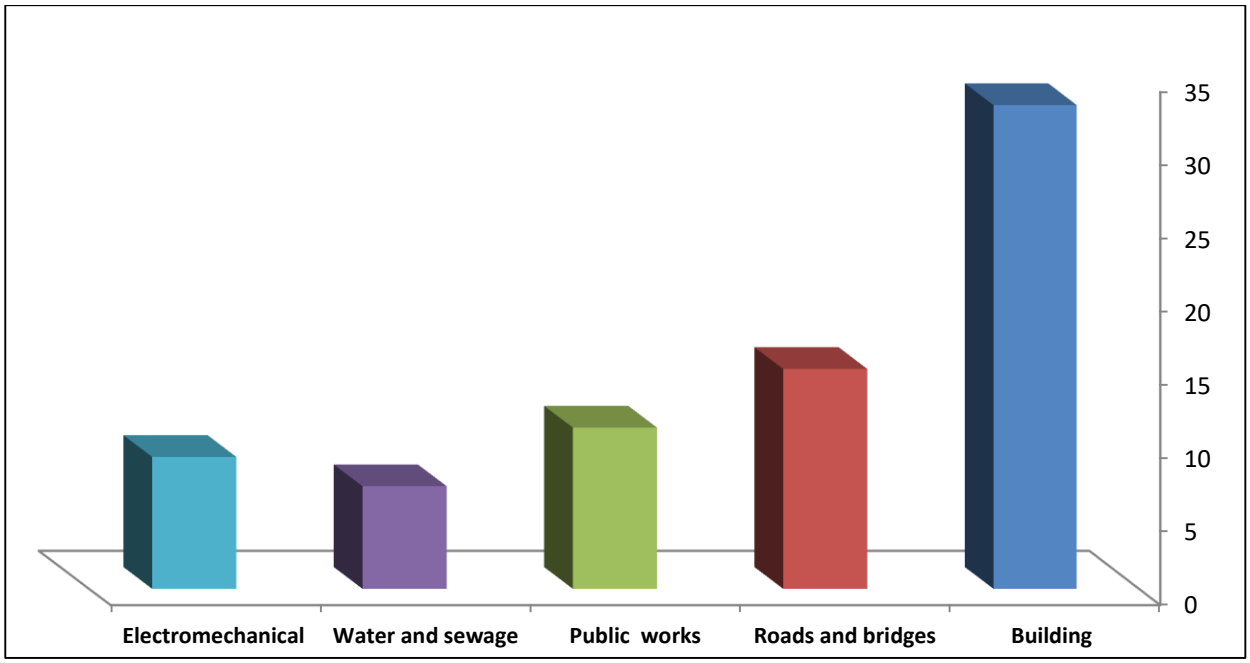

Figure (4.2): project Type

The previous table shows that most of the contracting companies in which the engineers work in the study sample were (building) companies; where they numbered 33 engineers, with a percentage of 44.0%, while there were 20.0% working in companies (roads and bridges), with a percentage of 14.7 % , in (general works) companies, and 9.3% work in (water and sewage) companies, and 12.0% work in (electromechanical) companies.

4.2.1 Preferred engineering contract type

Table (4.3) Distribution of sample individuals according to the type of engineering contracts that the company prefers to work with

Preferred engineering contract type	**Frequency**	**Percentage**
Competition contracts (lump sum)	20	26.7%
Competition contracts (prices unit)	30	40.0%
Turnkey contract	10	13.3%
Project management contracts	15	20.0%
Total	**75**	%100.0

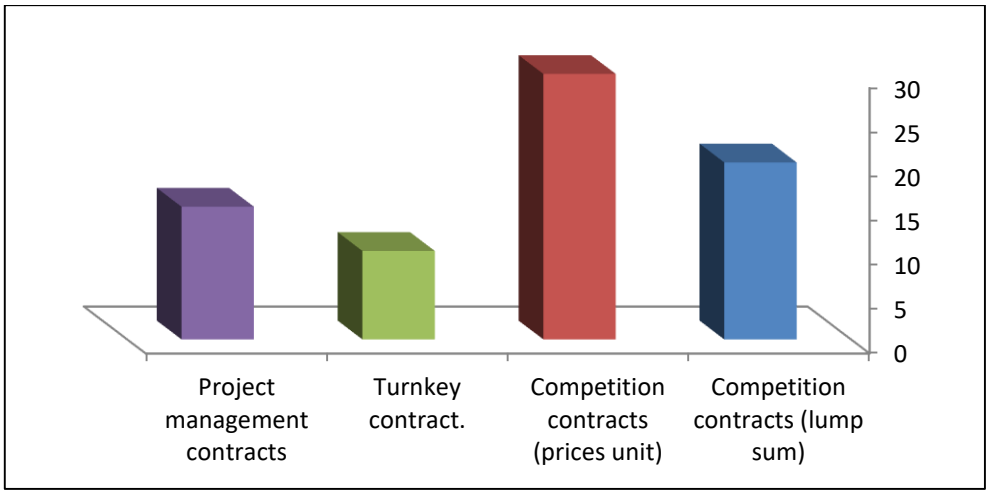

Figure (4.3): Preferred engineering contract type

The previous table shows that most contracting companies prefer to work in competition contracts (unit prices) at a rate of 40.0%, followed by competition contracts (lump sum) at 26.7%, by project management contracts at a rate of 20.0%, and finally the turnkey contracts at 13.3%

4.3 Presence of a dispute

Table (4.4) Distribution of sample individuals according to presence of dispute

presence of dispute	**Frequency**	**Percentage**
Yes	40	53.3%
No	35	46.7%
Total	**75**	%100.0

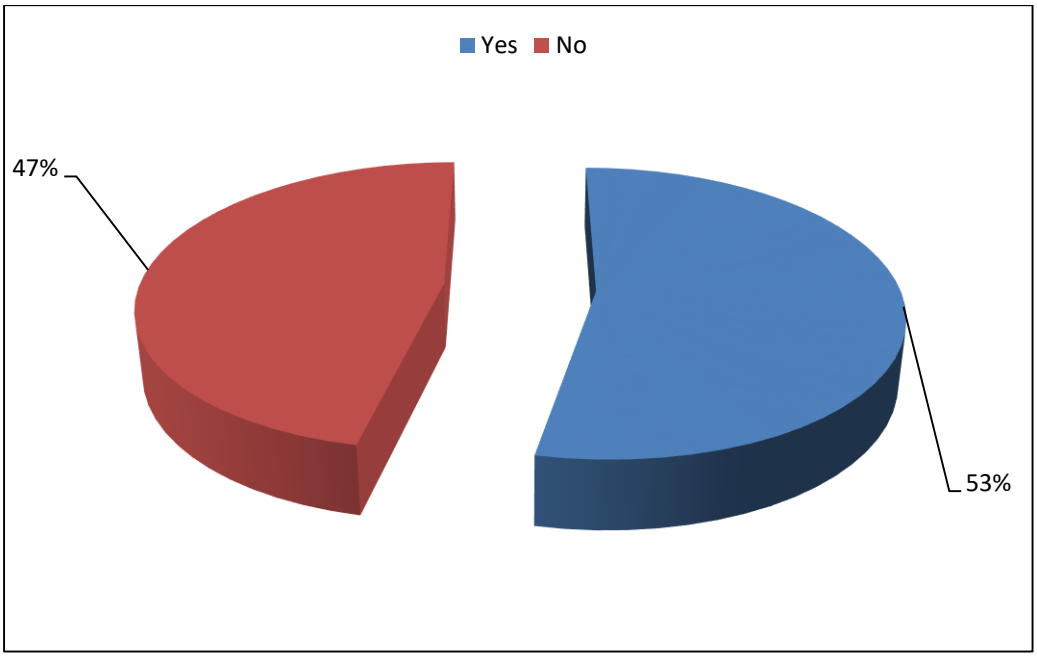

Figure (4.4): presence of dispute

The previous table shows that 53.3% of the contracting companies have a dispute with the business owner over the interpretation of the contract the terms of its implementation, while 46.7% did not have any dispute .

4.3.1 Disputes and problems faced by companies in implementing construction contracts

In this part, the responsibility for applying local laws in contracts was identified, and the problems and disputes faced by construction companies in implementing contracts, are shown in the following tables:

1- Company Classification

Table (4.5) Answers of respondents on the best contracts

Best contracts	Frequency	Percentage
Governmental contracts	32	42.7%
Municipal contracts	7	9.3%
Local private contracts	10	13.3%
Foreign contracts	26	34.7%
Total	**75**	%100.0

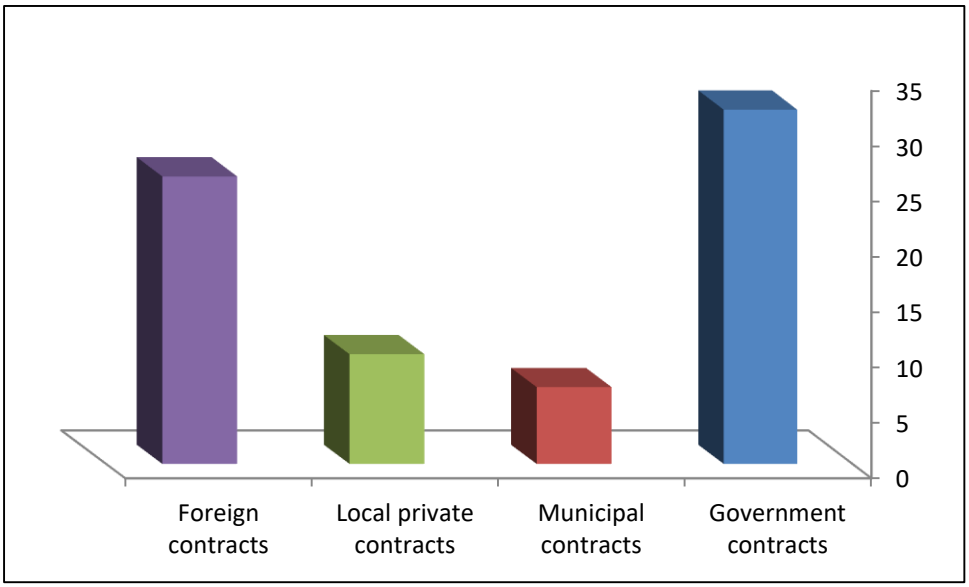

Figure (4.5): best contracts

The previous table shows it is clear that the best contracts that are clear, explanatory and comprehensive in all aspects of the project are government contracts, where most of sample members agreed to this, with 32 engineers constituting 42.7%, while the percentage of those who see that foreign contracts are the clear, explanatory and comprehensive were 34.7%. There are 13.3% who believe that local private contracts are

the most obvious, and 9.3% believe that municipal contracts are the clearer and comprehensive.

2- Responsibility to observe laws

Table (4.6) Answers of respondents about the Responsibility to observe local and municipal laws.

Responsibility to observe laws	**Frequency**	**Percentage**
Employer	12	16.0%
Engineer	8	10.7%
Contractor	6	8.0%
All Parties	38	50.7%
Engineer and contractor	11	14.7%
Total	**75**	%100.0

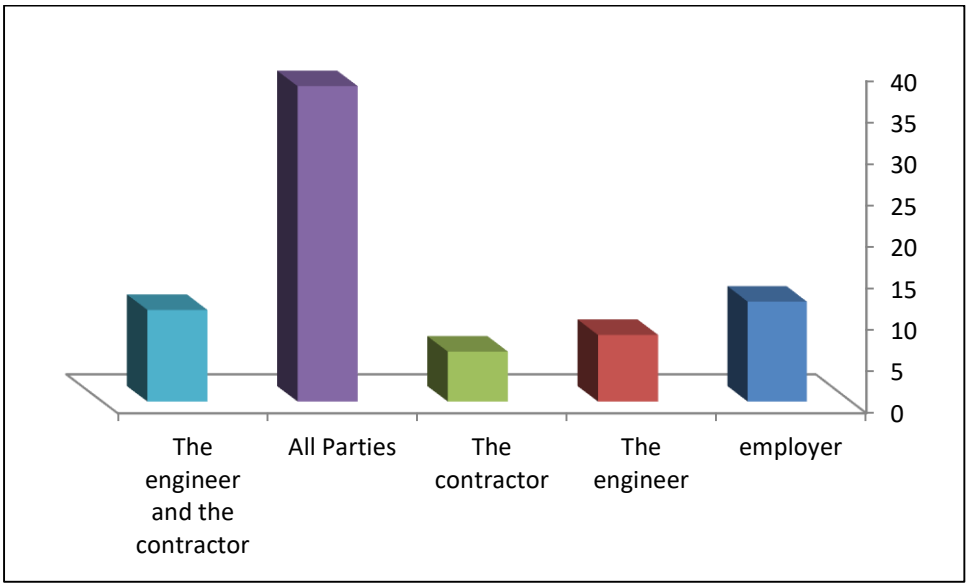

Figure (4.6): Responsibility to observe laws

Data of the previous table indicate that most of the sample individuals from the engineers agreed that observing the local and municipal laws is the responsibility of all parties to the contract with a percentage of 50.7%; 16.0% believed that the employer is

responsible for implementing the laws related to the contract; 14.7% believed that the engineer and the contractor were responsible, believed 10.7% the responsibility was of the engineer, and 8.0% believed that the responsibility was of the contractor.

3- If conflict exists in contract documents, then priority is outlined in the following table

Table (4.7) Answers of respondents about conflict existing in contract document

problem of inconsistency of information	Frequency	Percentage
Drawings	9	12.0%
Bills of Quantities	10	13.3%
General Condition's	11	14.7%
Supplementary Conditions	10	13.3%
FIDIC (Ministry of Works)	35	46.7%
Total	**75**	%100.0

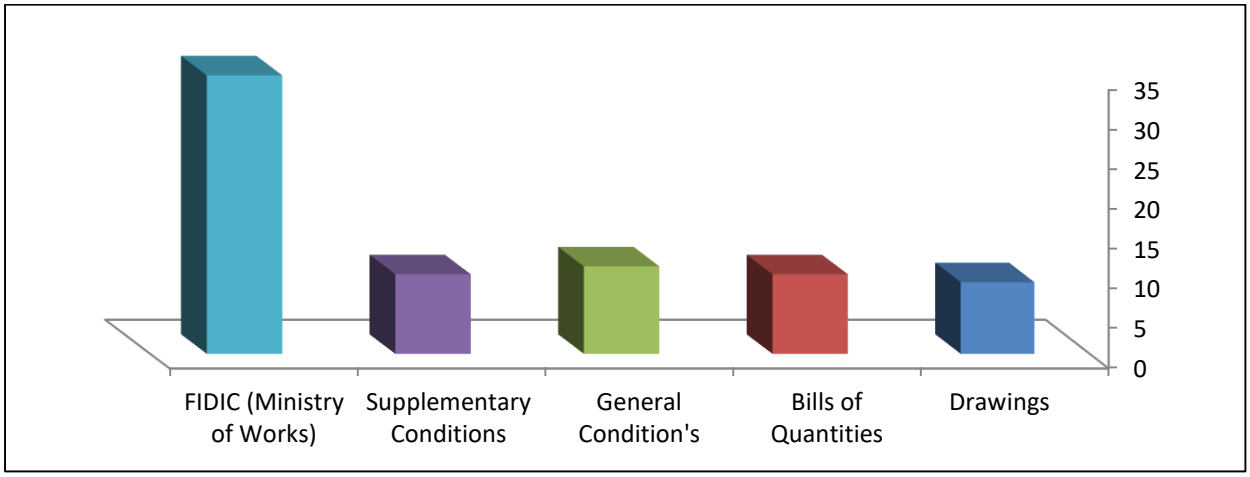

Figure (4.7): conflict existing in contract documents

The previous table shows that most of the sample's engineers agreed that in case conflict exists in contract documents, the priority will be for FIDIC contracts, where the percentage was (46.7%)

4- The following table presents disagreements between the owner and the contractor

Table (4.8) Answers of respondents about disagreements between the owner and the contractor happens mostly during

problem information inconsistency	Frequency	Percentage
Signing the contract	7	9.3%
Execution of the contract	20	26.7%
First delivery of works	33	44.0%
Maintenance and final delivery	11	14.7%
Others	4	5.3%
Total	**75**	%100.0

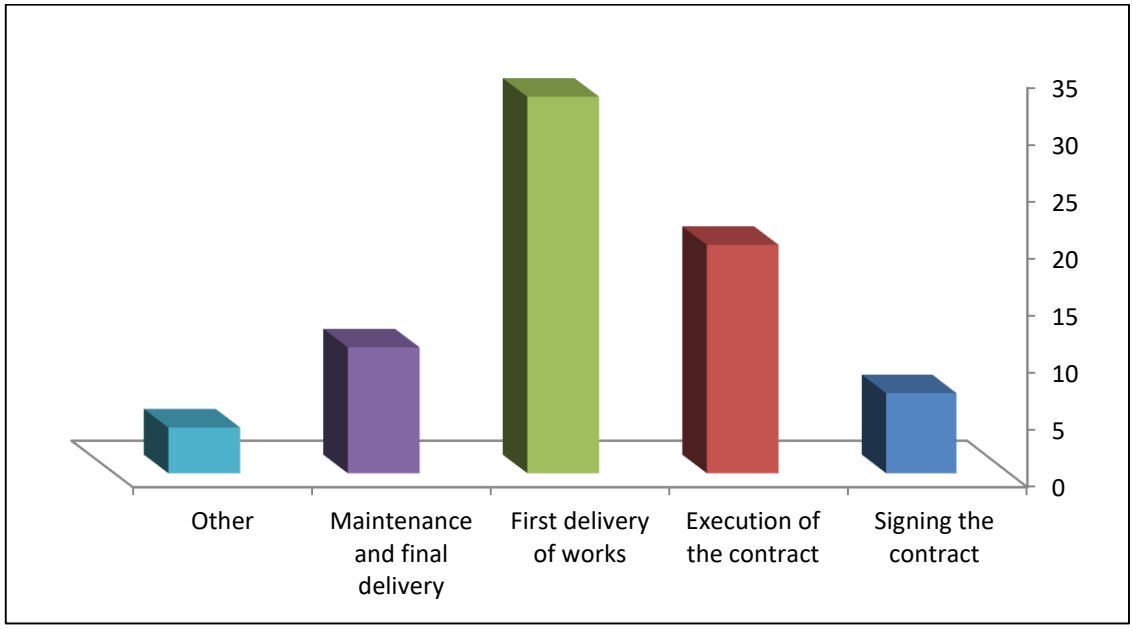

Figure (4.8): Disagreements between the owner and the contractor happens mostly during

The previous table shows that most of the disagreements between the owner and the contractor occur at the initial delivery stage of work, with a percentage of (44.0%),

while there are (26.7%) of the differences are that occur during the implementation of the contract, and what is (14.7%) accur during maintenance and final handing over,while (9.%) accur during signing the contract.

5- Most disagreements happen during execution because of owner as revealed in the following table

Table (4.9) Answers of respondents about disagreements between owner and contractor

problem of information inconsistency	**Frequency**	**Percentage**
Delay of contractor payments	35	25.4%
Interfering with woks & changing their specifications repeatedly	25	18.1%
Lack of observing the engineer	22	15.9%
Slow in making decisions	24	17.4%
Not compensating the contractor under force majeure conditions	20	14.5%
Delay in receiving or delivering the work site	12	8.7%
Total	**75**	%100.0

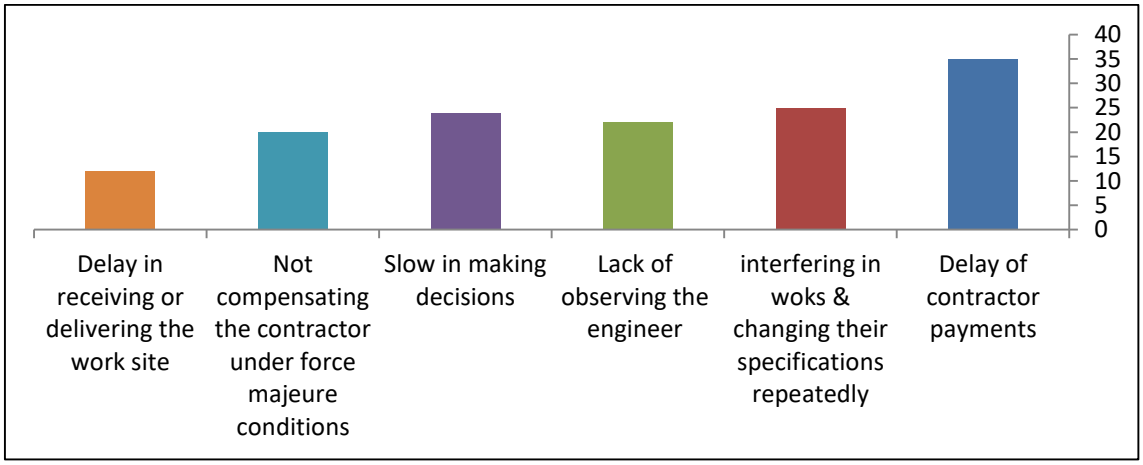

Figure (4.9): Disagreements between owner and contractor

From the previous table, it is noted that the reason behind disagreements between the owner and the contractor is due to the delay of the employer in paying the contractor's dues, where (25.4%) of the engineers agreed. They also agreed that (employer's delay in receiving or delivering of sites) is the least influential cause (8.7%).

6- Most disagreements happen during execution because of the owner as demonstrated in the following table :

Table (4.10) Answers of respondents about contracts problems

Contracts problems	**Frequency**	**Percentage**
Not reading & understanding contracts before signing	30	29.7%
Unclear contract items	40	39.6%
Incomprehensive contract items	17	16.8%
Repeating the same contract forms for all projects	14	13.9%
Total	**101**	%100.0

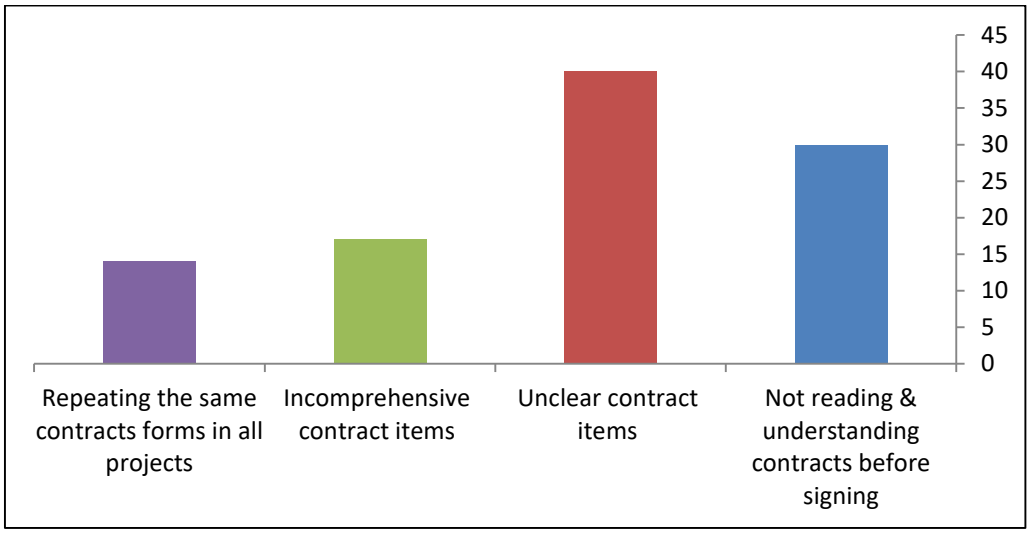

Figure (4.10): Contract problems

From the previous table, it is noted that most of contract problems are caused by the lack of clarity of its clauses with a percentage of (39.6%) of the study sample. The least contract problems caused by the repetition of the same contract clauses for all projects with a percentage of (13.9%).

7- Arbitration sometimes fails in resolving engineering disputes as the following table shows:

Table (4.11) Answer of respondents about Arbitration failure

Reasons of failure	Frequency	Percentage
Absence of specialized arbitrators	17	22.7%
Unclear contract items	25	33.3%
Incomprehensive contract items	18	24.0%
Repetition of the same contract forms for all projects	15	20.0%
Total	**75**	**%100.0**

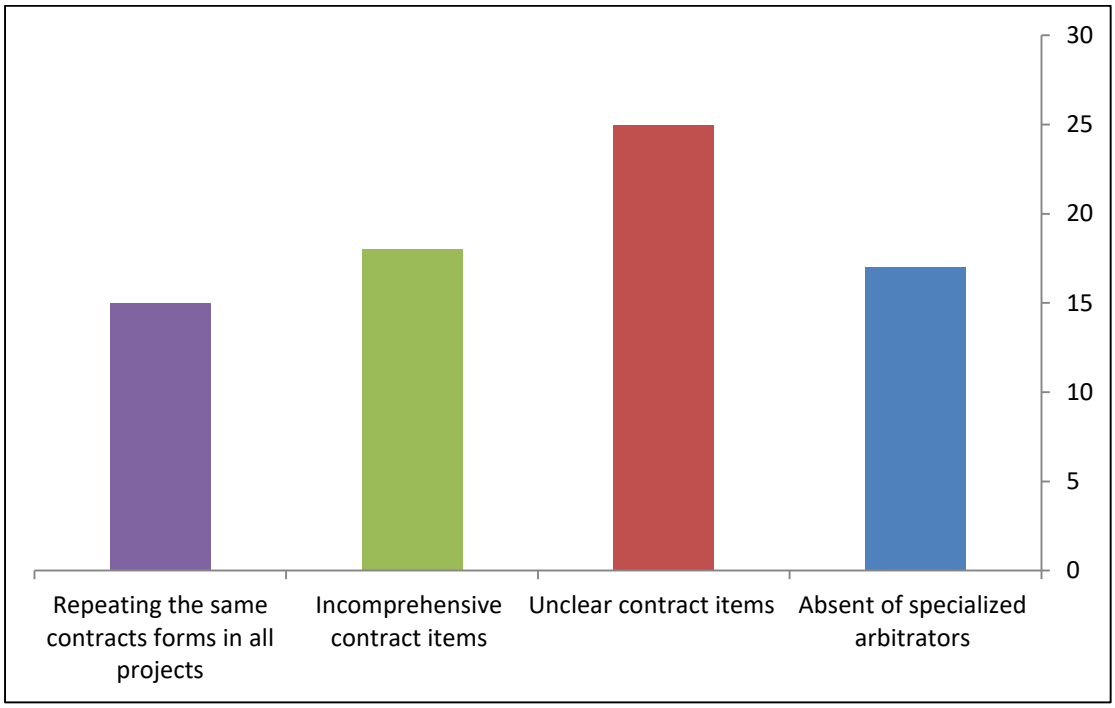

Figure (4.11): Arbitration failure

From the previous table, it is noted that the most important reason that lead to failure of arbitration in resolving engineering disputes is lack of authority for arbitrators over the conflicting parties, with a percentage of (33.3%).

4.4 Standard Normal Distribution

Normal distribution use for testing the research hypothesis. Z values were in the range (-1.96 to 1.96) for two tails, based on a confidence level estimated of 95%. Equation below shows the calculation of "Z" value for each question.

$$Z = \frac{\bar{x} - \mu_o}{\frac{\sigma}{\sqrt{n}}}$$

Mean of population $\mu_o = \frac{1+2+3+4+5}{5} = 3$

Where:

$\bar{x}$: mean of sample ;

σ: standard deviation;

n: number of sample members

4.5 Professional practices (engineering and legal) in contracting contracts used in Amman.

Each item in the scale of professional practices was given a score to be statistically treated as follows:

- Strongly Agree = 5 Agree = 4 Neutral = 3
- Disagree = 2 Strongly Disagree = 1

First: (1 - less than 2.33) low.

Second: (from 2.34 - less than 3.67) medium degree.

Third: (from 3.68-5) a high degree

Accordingly, the following measure was adopted to judge the arithmetic mean for the level of professional practices:

To get acquainted with professional practices in contracting contracts used in Jordan, means and standard deviations for the answers of the study sample were calculated at the level of these practices. The results are presented in Table (14)

Table (4.12) Means and standard deviations and hypothesis test for the (professional practices in contracting contracts) items

Rank	No	items	Mean	Std. Deviation	Level	Z
1	18	If the engineer issues an oral order during the implementation of the project, I will never implement it unless it comes in support of a written request signed by the engineer.	4.16	1.17	High	8.59
2	4	The item "awarding the bid without giving reasons" is an unjust clause against the competing contractors, as it is their right to know the reasons for which one of them won	4.01	1.16	High	7.54
3	7	The bid may be anchored at the lowest prices provided that the employer puts justifications for this in front of the competing contractors	3.97	1.13	High	7.43

Rank	No	items	Mean	Std. Deviation	Level	Z
4	15	If the employer delays the contractor by paying his dues on the dates stipulated in the contract, then the contractor has the right to demand compensation for it either by paying additional sums to him or increasing the time period according to the delay period.	3.95	1.09	High	7.55
5	17	Careful supervision and good supervision of the engineer does not harm the contractor or indicate lack of confidence in him, but rather motivates him to work better.	3.93	1.32	High	6.1
6	13	The order of priority for the contract documents must be clear and stipulated in the contract, otherwise the contractor can determine the priority as it deems appropriate.	3.91	1.18	High	6.68
7	14	The law guarantees the contractor's right to request compensation in the event of an increase in the price of raw materials due to conditions that an expert contractor could not have expected and the employer should compensate him for the amount of this increase.	3.91	1.07	High	7.37
8	19	The implementation of any contract cannot be free from disputes and disputes, no matter how clear the contract is, so this must be taken into account in the implementation of the various projects.	3.91	1.15	High	6.85
9	24	There are some clauses in contracts that can be disputed without any explanation in the law.	3.87	1.08	High	6.98

Rank	No	items	Mean	Std. Deviation	Level	Z
10	23	I can say that I am aware of and familiar with the laws that regulate engineering contracts in Jordan, especially those related to contracting contracts	3.85	1.07	High	6.88
11	3	The employer's determination of the degree of classification of contractors who are permitted to enter into the tender is considered justified and necessary	3.80	1.23	High	5.63
12	2	Tenders are usually announced in the official newspapers and the announcement is clear, unambiguous and comprehensive of the necessary information	3.75	1.12	High	5.8
13	16	The engineer can issue change orders at any time during the implementation of the project even during the maintenance period as long as it is necessary to complete the work	3.73	1.38	High	4.58
14	9	The longer the project implementation period, the greater the differences between the project parties.	3.72	1.39	High	4.49
15	8	The more the bid is the least expensive than the market price, it is less good in terms of materials, workmanship and performance by the contractor staff.	3.69	1.34	High	4.46
16	12	In the drafting of current contracts, consideration should be given to a fair distribution of the risks surrounding the project between the contractor and the employer.	3.68	1.18	High	4.99
17	5	It is preferable to enter into bids from government institutions over those from private institutions	3.61	1.41	Medium	3.75

Rank	No	items	Mean	Std. Deviation	Level	Z
18	20	When signing the contract, make sure that there is an item that defines the way to resolve disputes that may arise during the implementation of the contract.	3.59	1.42	Medium	3.6
19	22	Not all disputes can be resolved through arbitration, as there are some cases in which arbitration is not valid.	3.49	1.23	Medium	3.45
20	21	I prefer to resolve disputes amicably, even if it costs me a waiver of some rights.	3.32	1.35	Medium	2.05
21	6	If the business owner canceled the bid for any reason, the contractors may not claim any compensation due to the cancellation	3.21	1.45	Medium	1.25
22	10	Any clause omitted from the contract, which is an essential clause in the implementation of the project, implies that it will be executed by the contractor	3.21	1.40	Medium	1.3
23	1	Bidding currently in force can generally be judged as being subject to the principle of equality, fairness and freedom of competition	3.13	1.18	Medium	0.95
24	11	Any clause omitted from the contract, which is an essential clause in the implementation of the project, implies that it will be executed by the contractor	2.33	1.29	Low	- 4.5
Average mean (professional practice)			**3.70**	**1.2**	**High**	

Descriptive analysis of study variable for professional practices in contracting contracts of the Questionnaire was analyzed to find the means, standard deviations and Z-value; the questions are ranked from the highest to lowest mean.

As show in Tables (4.12), the responses to the first twenty three questions were positive, whereas the responses to the last question was negative relative to the scale mean of (3). It was found that the means of the first twenty questions ranged (from 2.05 to 8.59), indicating that there exist applications part of professional practices in contracting contracts used in Amman are effective and question 6 and 10 and 1 were ineffective and therefore failed to reject

The results of the previous table indicate that means evaluation of sample individuals for items of (professional practices in contracting contracts used in Amman), ranged between (4.16 - 2.33), and item(18): (If the engineer issues an oral order during implementation the project will never be implemented unless a written support of request signed by the engineer (is recived got the with mean (4.16) a high degree of practice, while item (11) (Any item that was omitted mentioned in the contract, which is an essential clause in the implementation of the project, it is implied that its implementation will be on the contractor) ranked pat the mean was (2.33) with a low score.

The data in the previous table also indicate that the mean for the degree of professional practices as a whole was (3.89), with a high degree of practice.

This means that if the engineer issued an oral order during the implementation of the project, it will never be executed unless it was supported by of a written request signed by the engineer. A warding the bid without giving reasons is unfair for competing contractors, as it is their right to know the reasons for which one of them won.

Likewise, the bid may be anchored at prices other than the lowest ones, provided that the employer puts justifications for that in front of the competing contractors. If the employer delays the contractor by paying his dues on the dates stipulated on in the contract, then the contractor has the right to ask for compensation either by paying additional sums to him or by increasing time period to make up for the delay .

4.6 Specifications of engineering contracts in Jordan

To get acquainted with the specifications of engineering contracts in Amman, arithmetic means and standard deviations were calculated for the answers of the study sample, the results are outlined in Table (4.13).

Table (4.13) Mean and Standard Deviations and Hypothesis test of (Specifications of Engineering Contracts in Amman) items

Rank	No	Item	Mean	Std. Deviation	Level	Z
1	25	In this type of contract, the plans and specifications for them must be very detailed and clear.	4.17	1.1	High	9.21
2	31	This type of contract can be used if the quantities and specifications of the project to be executed are not clear, specific or detailed when signing the contract.	4.08	1.0	High	9.35
3	30	This type of contract is the best type in force and the most preserving the rights of both the contractor and the employer.	4.04	0.9	High	10.0
4	32	The increase or decrease in the implementation of business quantities from 25% of the bid value without causing any change in the price is a very large percentage and is an indication of the inaccuracy of the quantities of items.	3.92	1.0	High	7.97
5	37	The contractor here does not bear any kind of risk. Rather, the entire risk is on the employer.	3.83	1.0	High	7.19
6	36	It is often preferred to use this type of contract only in special cases such as emergencies, necessities or speeds.	3.72	1.1	High	5.67
7	38	The contractor often buys high-priced materials in order to increase his profit rate.	3.59	1.2	Medium	4.26

Rank	No	Item	Mean	Std. Deviation	Level	Z
8	27	This type of contract is only suitable for small projects. As for medium or large projects, it is not appropriate to use them.	3.57	1.1	Medium	4.49
9	35	The contractor's risk ratio here is very low compared to other types of contracts.	3.56	1.4	Medium	3.46
10	26	Any unforeseen circumstances or additional work that may occur in the project during implementation will be borne by the contractor only.	3.55	1.3	Medium	3.66
11	33	In this type of contract, bids are awarded in most cases, if not all, at the lowest rates, especially if the business owner is an official institution.	3.52	1.3	Medium	3.46
12	34	Referring to the tender at the highest price or at a price higher than the market price costs the business owner additional amounts without a noticeable increase in the level of quality of work or workmanship.	3.44	1.3	Medium	3.93
13	29	In this type of contract, the contractor is obliged to increase the bid price so that it makes it very high in anticipation of any price increase or any other circumstances that may arise on the project.	3.43	1.2	Medium	3.10
14	40	I do not recommend using this type of contract in general and under normal circumstances, and I prefer using other types of contracts over this type	3.33	1.3	Medium	2.2
15	28	Agreeing on a lump sum for the implementation of this contract confirms that this amount cannot be modified, decreased or increased, no matter how much or how much works are increased or decreased.	3.28	1.2	Medium	2.02

Rank	No	Item	Mean	Std. Deviation	Level	Z
16	39	This type of contract does not require accuracy of specifications or plans when signing the contract, as the contractor can be provided with it during implementation	3.25	1.3	Medium	1.67
17	41	The practices currently used in implementing this type of contract are valid in terms of contract formulation, method of implementation, financial claims and method of disbursing payments to the contractor	3.03	1.3	Medium	0.2
Average mean (specifications of engineering contracts in Amman)			**3.61**		**Medium**	

4.7 Findings

Descriptive analysis of study variable for specifications of engineering contracts in Amman of the Questionnaire was analyzed to find the means, standard deviations and Z-value; the questions are ranked from the highest to lowest mean.

As show in Tables (4.13), the responses to the first seveteen questions were positive, relative to the scale mean of (3). It was found that the means of the first fiveteen questions ranged (from 2.05 to 10.00), indicating that there exist applications part of specifications of engineering contracts in Amman are effective and question 39 and 41 were ineffective and therefore failed to reject

Results of the previous table indicate that the means of the sample's estimates of the field items (specifications of engineering contracts in Amman) ranged between (4.17 - 3.03), and items (25) (In this type of contract, the plans must be And its specifications are detailed and very clear) ranked first with a mean (4.17) and a high degree. while Paragraph No. (41) (In this type of contract, the plans and specifications for it must be very detailed and clear) ranked last with a mean of (3.03) and medium score.

Data in the previous table also indicate that the mean for the degree of field (specifications of engineering contracts in Amman) as a whole amounted to (3.61), with

a medium degree. The results indicated that in this type of contract, the plans and specifications for them must be very detailed and clear and that this type of contract can be used if the quantities and specifications of the project execution are not clear, specific or detailed when signing the contract.

The results also indicated that this type of contract is the best type in force and the most preserving the rights of both the contractor and the employer, and that increasing for or decreasing the implementation of business quantities for 25% of the bid value without causing any change in the price is a very large percentage and is an indication of inaccurate quantities of items.

Through analyzing the data and information obtained from individuals of the study and from the engineers working in the contracting companies, a set of important results were reached; the foremost of these results is that the best contracts that are clear, explanatory and comprehensive in all aspects of the project are government contracts, where most of sample members agreed to this, with 32 engineers constituting 42.7%, , and take into account the local and municipal booths in these contracts are the responsibility of all parties to the contract with percentage of 50.7%.

the results also showed that most distinctive differences between the employer and the contractor occur at the initial delivery stage of work, with a percentage of (44.0%), The reason for these differences between (the employer) and (the contractor) is due to the delay of the employer in paying the contractor's dues where (25.4%) of the engineers agreed on that, Most of the problems that cause the differences are due to lack of clarity in terms of the contracts with a percentage of (39.6%) When resorting to arbitration to resolve disputes between parties to the contract, arbitration may often fail due to the lack of authority for arbitrators over the disputing parties and this is what was agreed with (33.3%) The results indicated that if the engineer issued an oral order during the implementation of the project, it will never be executed unless it came in support of a written request signed by the engineer, and if the employer delays the contractor by paying his dues in the dates stipulated on in the contract, then the contractor has the right to demand compensation for it either by paying additional amounts for him or by increasing the time period according to the delay time.

Chapter (5)

Conclusions and Recommendations

5.1 introduction

This research adds a real contribution to Jordanian construction contracting studies. This contribution is represented by enlightening and clarifying very important issues when contracts are legally formulated. This research also gives an in-depth view on several practices appears during the application of contracts, these practices are also reviewed and evaluated from two perspectives: engineering, legal. The most important addition is that the results of this study will provide researchers with new information that can be used to develop construction industry in Jordan.

5.2 Conclusions

After analyzing the results collected from the questionnaire, the study came up with many findings , the most important of which are:

1- 40% of the contracting companies prefer to work in competition contracts (unit prices), due to the fact that this type of contract is fair, clear and accurate, and the implementation of the contract will be the most efficient and most competitive company . That is why it is preferred by many contracting companies.

2- Contracting companies in general are exposed to many disputes emerging from interpretation of the contract and terms of implementation with the employer. Therefore most companies prefer government contracts because they are clearer, explanatory and comprehensive in all aspects of the project the differences in them are few as all parties to the contract are responsible for implementing the terms of the contract and abide by them.

3- The differences between the employer and the contractor occur at the initial handover phase of works with a percentage of 44%. The differences are due to the lack of clarity in terms of the contracts in the first place, and to the delay of

the employer in paying the contractor's dues. When there are differences, the parties will resort to arbitration.

4- Although the parties to the contract have resorted to arbitration to resolve disputes, arbitration may fail for various reasons. The most important reason of that is the lack of authority for arbitrators over the conflicting parties with a percentage of 33.3% of that agreed upon Therefore even if a ruling is issued to resolve the differences, only one of the parties to the contract may not implement what was agreed upon.

5- In order to guarantee the contractor's right, verbal orders must be confirmed in writing, as indicated in Question No. 18 where the value of z = 8.5.9.

6- Most engineers and owners of construction companies see that the item "awarding the bid without giving reasons" is an unfair clause against competing contractors, as it is their right to know the reasons for which one of them won. The researcher attributes this result to knowing the reasons for winning the bid or winning the implementation of the contract makes the bidding transparent . It is clear that knowing the cause is useful so that the error will be remedied in the future will be used, a correct method if there is no error in bidding.

7- The results of the study showed that if the employer delayed the contractor by not paying his dues on the stipulated dates in the contract, the contractor has the right to claim compensation either by paying additional amounts to him or by increasing the time period in accordance with the delay period. This is due to the fact that delaying the contractor harms him and his business .

8- The increase or decrease in the implementation of the business quantities from 25% of the bid value without causing any change in the price is a very large percentage and an indication of inaccuracy of the quantities of the elements.

9- For the construction projects to correctly continue without disruption or damage to all parties, the employer must abide to pay the financial dues on the specified dates. Otherwise, he has the right to demand time and material compensation for that to ensure the continuity of the work as indicated in question No. 14 value z = 7. 37

10- To secure a high quality success of projects is the presence of good supervision and control as question no.17 where the value was z=6.1

11- The construction contracts in Amman are not free from disputes. This was evidenced by question number 19 and the value of z = 6.85.

12- To obtain a high quality successful project, the engineer must issue variation orders in the necessary works absent from the original contract. This was indicated by question number 16 and the value of z = 4.58

13- If was found that all emerging disputes between the owner and the contractor do not end through arbitration, and the non-solved part of arbitration goes to the court. This is indicated by question number 22 and the value of z = 3.45.

5.3 Recommendations

The researcher would like to recommend the following :

1. The need to announce the bids in the official newspapers and any means to reach the stakeholders easily. The announcement should be clear, unambiguous and comprehensive , to include information necessary for implementation.
2. The necessity of taking into account the distribution of risks surrounding the project between the contractor and the employer in a fair distribution in drafting contracts currently in circulation.
3. All parties to the contract, upon signing the contract, must ensure that there is a clause specifying the method for resolving disputes that may occur during the implementation of the contract.
4. When a dispute occurs, all parties to the contract must try to resolve these differences amicably and avoid resorting to arbitration.
5. Working to establish legal legislation binding to the parties of the contract, specifying each party's responsibility, and the effects of this responsibility.

5.4 Recommendation for future research:

This study is a step in a long way in reviewing and evaluating construction contracts in Aman. This research stimulates others to improve the contracts more and more. This study opened the way for others to continue work through several areas, these areas include:

1. The same study might be conducted to owners, to view their opinions, to know their claims relating to contracts and any problems or risks facing them when applying contracts.

2. Researchers are invited to develop a suitable unified contracting contract for construction works in order to help owners and contractors. This suggested contract should be appropriate to the Jordanian special situation .

3. It is necessary to repeat this research every five years to observe and study the new trends of contractors.

4. There is a need for additional studies on other issues and practices relating to construction industry in Jordan such as:

- Causes of contractors failure in Jordan.
- Construction projects management in Jordan.
- Managing construction claims.

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Appendices

Appendix 1: Questionnaire

Appendix 2: Contracts Specification in General (Table).

Questionnaire

Construction Contracts Used in Jordan

1. Company classification according to PCU

□ 1st Category □ 2nd Category □ 3rd Category □ 4th Category □ 5th Category □ 6th Category

2. Types of most accomplished projects

□ Buildings □ Roads □ Water and Sewage □ Electro-mechanic □ General Works

3. Types of construction contracts that your company prefers to contract with

□ Lump-Sum Contracts □ Unit Price Contracts

□ Cost plus Contracts □ Turnkey Contracts

□ Design-Build Contracts □ Other (Mention) ……

4. Types of construction contracts that your company does not prefer to contract with

□ Lump-Sum Contracts □ Unit Price Contracts

□ Cost plus Contracts □ Turnkey Contracts

□ Design-Build Contracts □ Other (Mention)

…….....…

5. Have your company ever disputed with the owner of any project you executed about contract interpretation? □ Yes

□ No

The third axis: specifications of construction contracts used in Jordan

1. The most obvious and comprehensive contracts used are those of

□ Governmental Ministries □ Foreign Institutes □ Municipalities □ Private Local Institutes □ Other (Mention)

…….

2. Local and municipality laws of project area consideration is the responsibility of

□ Owner □ Engineer □ Contractor □ All Parties □ Engineer & Contractor only

3. When a conflict exists between contract documents, then the priority is to the

□ Drawings □ Bills of Quantities □ General Condition's □ Supplementary Conditions □ FIDIC (Ministry of Works)

4. The disagreements between the owner and the contractor happens mostly during

□ Signing the contract □ Execution of the contract □ First delivery of works □ Maintenance and final delivery □ Other (Mention) …….

5. Most disagreements happening during execution because of OWNER are often because (more than one answer can be chosen)

□ interfering in woks & changing their specifications repeatedly □ Delay of contractor payments □ Lack of observing the engineer □ Slow in

making decisions □ Not compensating the contractor under force majeure conditions □ Delay in receiving or delivering the work site

6. Most disagreements happening during execution because of ENGINEER is often because (more than one answer can be chosen)

□ Lack of authorities given to him □ Lack of supervision on works □ His poor experience in work execution □ Changing specifications continuously □ His oral instructions & orders □ Slow in making decisions

7. Most construction contracts problems are mainly because of (more than one answer can be chosen)

□ Unclear contract items □ Incomprehensive contract items □ Not reading & understanding contracts before signing □ Difference between contracts and site conditions □ Repeating the same contracts forms in all projects

8. Arbitration sometimes fails in resolving engineering disputes because of

□ Absent of specialized arbitrators □ Lack of authority of arbitrators on dispute parties

□ some items don’t have reference in law □ Other (Mention)

……

The third axis: specifications of construction contracts used in Jordan

Specifications of construction contracts used in Jordan

Please indicate your opinion in the following questions about practices of contracts used in Jordan based in your experience in construction contracts.

No	Construction Contracts Specifications	Agreement Level				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
	Construction Contracts in General					
1	When judging on bidding practices in general it subdues to equity and full competition principles.					
2	Announcement of bidding is made on official newspapers and it is clear and unambiguous.					
3	Selecting contractors' categories by owner					

	is an acceptable and important matter.					
4	The item is an unfair for competitive contractors because it’s their right to know the reason of the 9bid winner.					
5	Bids of governmental institutes are better than those of private ones.					
6	If the owner closed down the bidding because of any reason the contractors shouldn’t.					

No	**Construction Contracts Specifications**	**Agreement Level**				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
7	The bid may be awarded to other than lowest price but the owner must justify this to the					

	competitive contractors.					
8	When the bid is the lowest comparing with market price it will be also the lowest in quality.					
9	As the period of					

	the project is large, the disagreements also enlarge between contract parties.					
10	Any major item forgotten in the contract is					

	understood to be executed by the contractor.					
11	It is cared in formulating contracts to distribute the risks between the owner and					

	contractor fairly.					
12	The priority to the contract documents should be clear in the contract, otherwise the contractor can prioritize					

	it as he wants.					
13	The law guarantees the right of the contractor to request compensation if any increase in materials prices happened					

	because of any unexpected circumstances and the owner should compensate him.					

No	**Construction Contracts Specifications**	**Agreement Level**				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
14	If the owner delayed payments					

	to the contractors on scheduled time, the contractor have the right to demand compensation by additional payments or additional time.					
15	The engineer can give change orders at any time during execution even during maintenance period if it is					

	necessary to accomplish works.					
16	Supervising works from the engineer doesn't indicate non confidence or harm the contractor; it instead motivates him to work better.					
No	**Construction Contracts Specifications**	**Agreement Level**				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1

17	If the engineer gave an orally order while works execution, the contractor shouldn’t perform it until it is documented.					
18	Not any contract can be empty from disagreements and disputes although if the contract is very clear.					

19	I care when contracting to the existence of an item that determines the way to resolute the disputes.					
20	I prefer to resolute disputes using amicable settlement although I may loose some rights.					
21	If amicable settlement doesn't solve the dispute, then I prefer to					

	solve it using arbitration rather than adjudication.					
22	I can say that I have the knowledge and understanding to laws and regulations that organize construction contracts in Jordan.					
23	There may exist some items in the contracts that may be a reason					

	for disagreements and disputes without any existence of interpretations of it in the law.					
No	**Construction Contracts Specifications**	**Agreement Level**				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1

contracts please indicate how contracts practices are:

No	**Construction Contracts Specifications**	**Agreement Level**				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
24	In this type of contracts, drawings and					

	specifications should be very clear and detailed.					
25	Any unexpected conditions or additional works may be needed during execution is committable by the contractor only.					
26	This type of contracts is appropriate to small projects only but does not					

	suit medium or large ones.					
27	The agreement on a lump sum payment makes sure that this sum can’t be changed although the works quantities may increase or decrease.					
28	The contractor finds himself needed to increase his price to make it very high frightening					

	of any unexpected increase on prices.					

Do you prefer to use this type of contracts? □ Yes □ No

- Why?

……

Any other comments:

1.

…….

2.

…….

3.

……..

No	Construction Contracts Specifications	Agreement Level				
		Strongly Agree 5	Agree 4	Neutra l 3	Disagree 2	Strongly Disagree 1
29	This type of contracts is the best on others used and the more keeping rights to both the contractor and the owner.					
30	This type may be used if the quantities and specifications of project aren’t very specified and determined clearly when contracting.					

31	Increasing or decreasing works quantities on a percent of 25% from bid value is a very large percent and indicates inaccurate items quantities.					
32	The bids are referred in most cases to the lowest prices especially if the owner is an official institute.					
33	Referring the bid to the highest prices or to a price more than market price costs the owner additional expenses					

	without better quality noticed.					
34	The risk is very little on the contractor comparing with other types of contracts.					

Do you prefer to use this type of contracts? □ Yes □ No

- Why?

……

……

Any other comments:

1.

……

……

2.

……

……

3.

……

……

No	Construction Contracts Specifications	Agreement Level				
		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
35	This type of contracts is mostly preferred in special cases only such as emergencies or speed or necessity.					
36	The contractor doesn’t hold any risks but all risks are hold by the owner.					
37	The contractor in most cases buys high price materials to increase his profit rate.					

38	It is not conditioned in this type accurate specifications or drawings when contracting because it can be given to contractors while executing the works.					
39	I don’t advice to use this type in general in ordinal circumstances; instead I prefer using other types of contracts					
40	The practices used in implementing these contracts’ are correct from formulating and executing it and bills of quantities and payments way.					

- Do you prefer to use this type of contracts? □ Yes □ No

- Why?

……

……

Any other comments:

1.

……

……

2.

……

……

الملخص

عقود البناء في عمان من الناحية الهندسية والقانونية

اعداد :

علي عبد الحكيم السكافي

اشراف :

الأستاذ: سعد العبد الله

هدفت هذه الدراسة الى التعرف على انواع عقود المقاولات وعرض الجوانب المتعلقة بالعقود من الناحية الهندسية والقانونية ودراسة وتقييم الممارسات المهنية وتكونت عينة الدراسة من (75) مقاول تم اختيارهم من عمان , ولقد استخدمنا الاساليب الكمية والنوعية ولتحقيق اهداف الدراسة استخدمنا استبيان مناسب تم عرضه على محكمين كما استخدم الوسط الحسابي والانحراف الميارى في معالجة البيانات احصائيا واظهرت نتائج العينة ان افضل انواع العقود والاكثر وضوحا وتفسيرا هي العقود الحكومية بنسبة (42.7) % وان معظم الشركات تفضل العمل في عقود المنافسة (اسعار الوحدة) بنسبة (40)% وان الالتزام بالقوانين المحلية والبلدية هي مسؤولية جميع الاطراف بنسبة (50.7) % وان الاولوية في حال وجود تعارض في وثائق العقد فستكون للفيديك بنسبة (46.7)% وانه اذا طلب المهندس تنفيذ امر فلا اقوم بتنفيذه ما لم يكن موقعا بطلب خطي منه حيث كانت قيمة اختبار الفرضية =8.59 وهو عامل مؤثر .